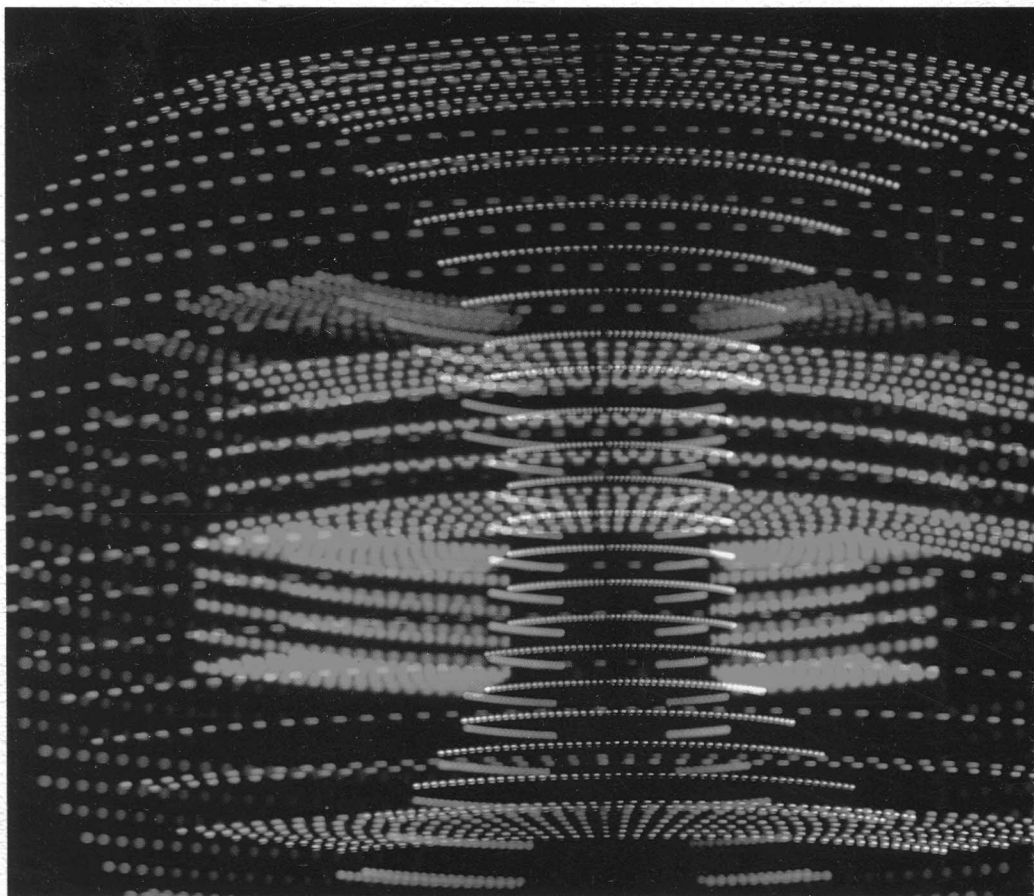


OPTO ELECTRONIC PRODUCTS



STANLEY ELECTRIC CO., LTD.

Our super-bright LEDs is the result of joint development by Stanley and the Semiconductor Research Promotion Association, under the leadership of Honorary Professor Dr. Junichi Nishizawa of Tohoku University. They represent the successful application of continuous epitaxial growth in the production of super-bright LEDs.

Stanley received high evaluations for these developments and was recognized by the presentation of the 26th Okochi Memorial Technology Prize for contributions to the enhancement of Japan's science and technology, the 7th Inoue Prize and the 1983 Nikkei Prize for superior product development. The DN series of high-output infrared LEDs was awarded the 1985 Nikkei Prize for superior product development.



Okochi Memorial Prize



Harushige Inoue Award



Nikkei Memorial Award

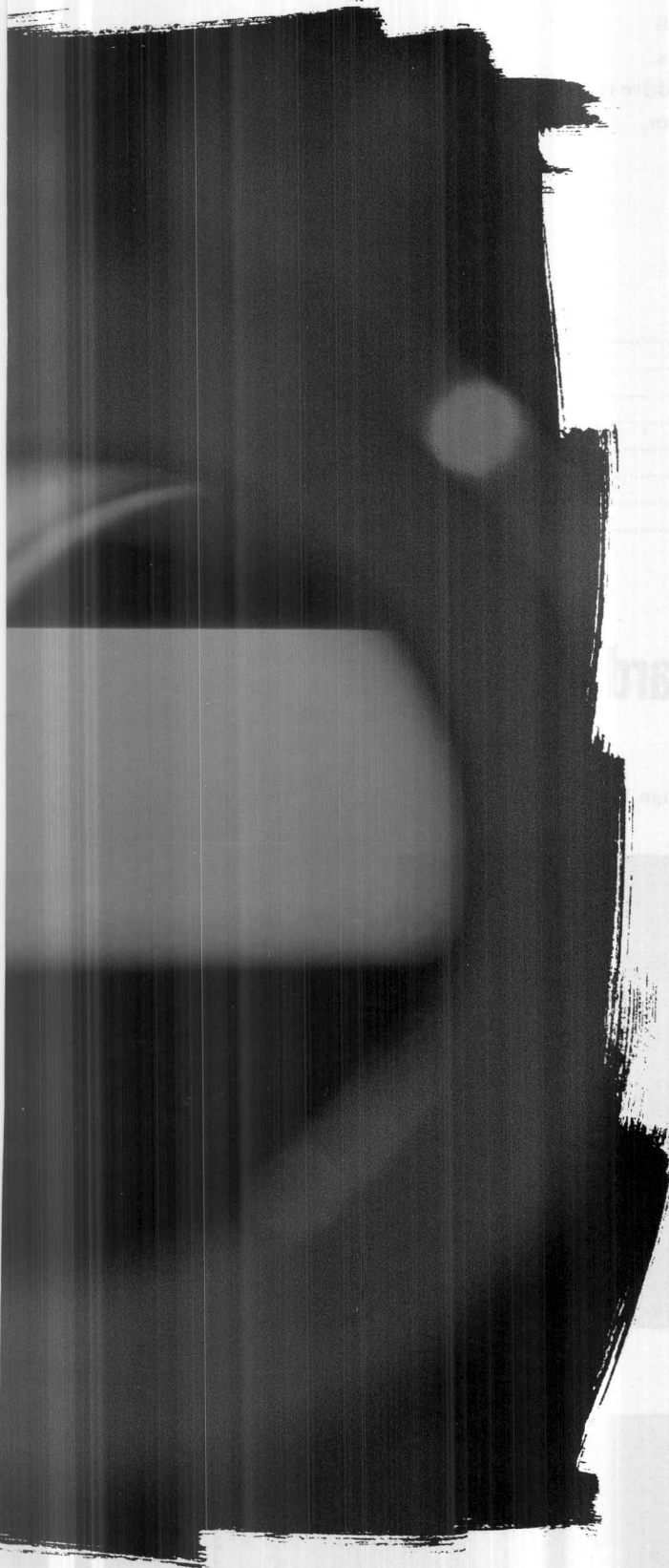


Large-scale display using LBig lamps at our R&D laboratory

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d LEDs.
hem.



Stanley always responds to the needs of the new age with the highest technologies and services.

Stanley uses the most advanced technologies in and high-level engineering in to provide clearer and more beautiful brilliancy.

A red light which has a 5,000-mcd brightness was realized by using a super-bright, top-level GaAlAs(gallium aluminum arsenide).

There are wide variety of color variations.

In addition to the super-bright red, the product line-up also includes a super-bright pure green LED with a peak wave length of 555 nm, as well as super-bright yellow and orange LED's.

These products provide the maximum in super-bright illumination, long service life and low power consumption characteristics.

Of course, they are used in AV, OA and telecommunication, indoor and outdoor displays for new information media, automotive high-mount stop lamps,

railway and traffic signals

and other applications for lighting indicators.

A high level of technology is used for LED print heads to maximize LED functions, light sources for reading and erase lamps.

The application fields are expanding without limitation.

Stanley's original unique technology is also used extensively in the production of infrared LED die materials capable of ultra high power output and high-speed response for optical fiber communication, sensors and customer's other diversified needs.

This catalog introduces

some of the major Stanley opto-electronics products.

Stanley is a good partner with the customers

and always provides the best quality and service.

Stanley provides products in response to the needs of the new age.

In order to satisfy our customers,

Stanley also performs best suitable design and production for customized specifications for client applications.

Indoor Sign Boards

The bright, vivid Stanley LEDs provide high levels of lamp illumination and directivity for indoor sign boards as well as in dot matrix display units.

The LMD series which has built-in drive circuits can be combined for any display sizes, and realize a wide viewing angle, clear and multi-color displays.

The LVISION and LJOY series are available as display systems.

Recommended LEDs

Lamps:	HBR5034X	P11
	EBR5034X	P11
	HBR7071X	P11
	HPY7071X	P11
	VRPY5345X	P26
	VRPG5345X	P26
Units:	MD Series	P44
	LMD Series	P46

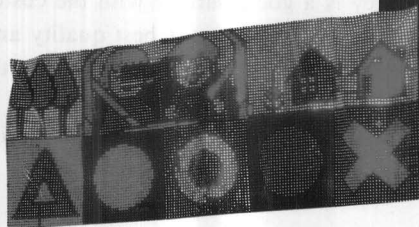
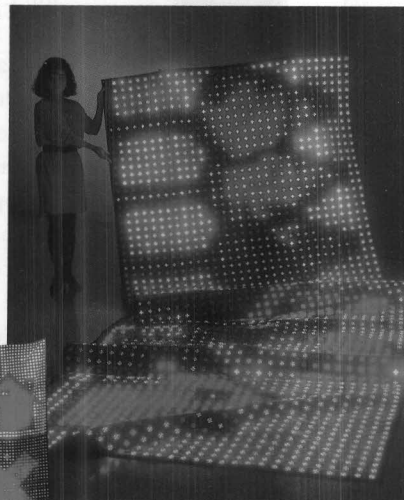


Outdoor Sign Boards

Stanley's world's leading LEDs are now available in the super-bright lamp type and unit type for outdoor sign boards which can be displayed in multi-colors.

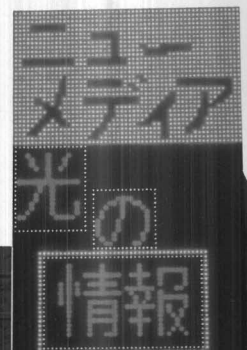
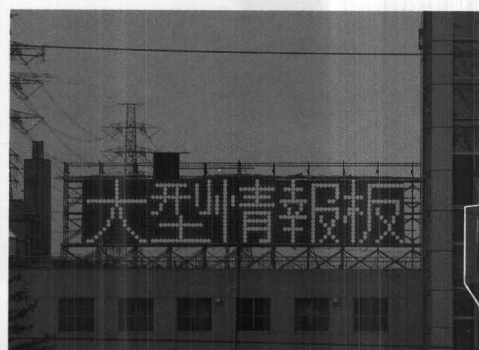
All units can withstand severe environmental conditions because they are completely waterproof, dustproof, and moisture-proof. Economical, maintenance-free displays are realized due to the low power consumption and long service life.

Stanley also provides software development, design and production for outdoor systems.



Recommended LEDs

Lamps:	H-1000-L	P10
	HYP5066X	P10
	KR5004X	P11
	KR5005S/KR5505S	P11
	ERPY7301X	P11
Units:	LBig Series	P48
	LOD Series	P51
	Honeycomb Wide Series	P52



AV Equipment

Stanley LEDs having wide range of variations, increase the sensitivity of AV equipment and improve the design individuality.

Stanley provide four colors of pure green, red, orange and yellow in a wide variety of packages.

Drive circuits are also assembled according to OEM specifications.



Recommended LEDs

□□50□4X	P13
□□5362X	P14
□□38□8S	P17
□□3365S	P19
□□22□2S	P20
□□5351K	P21
□□3363K	P23
□□4868K	P23
□□5379K	P23
□□3312X	P26
□□5314S	P26
Chip LED for Surface Mounting P30	

Lamps



OA Equipment

The super-bright, high-quality Stanley LEDs

are used in LED backlight system as well as combined panel assemblies, the numeric displays, and light bar module

in order to display complicated OA equipment functions

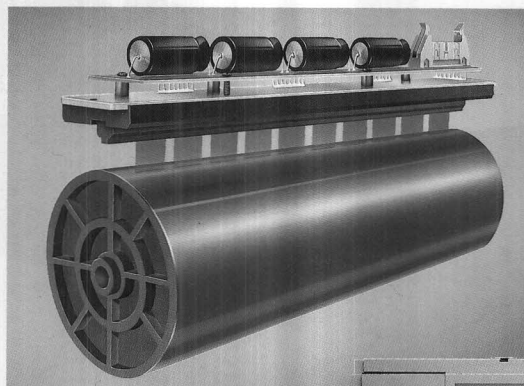
In addition to the above applications,

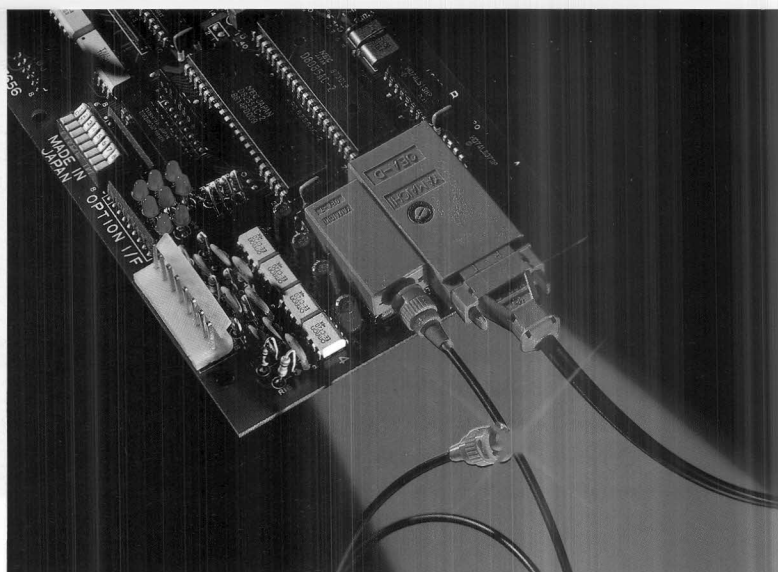
Stanley LEDs are used in LED print heads, light sources for read and erase lamps utilizing

highest level of LED characteristics and technology.

Recommended LEDs

□□5063X	P13
□□5362X	P14
Lamps:	
□□3361X	P18
□□3365S	P19
□□5351K	P21
Light Bar Modules:	
Mu Series	P32
Numeric Displays:	
ND Series	P36





Optical Communication

The 511 series is designed for the high output and high-speeds required in optical communication and are most suitable for use as a light source for plastic fiber and glass fiber.

The same shaped high-sensitivity optical receptors (photo transistors, PIN photo diodes) are also included in a series and used in a wide range of optical communication fields.

■ Page 53

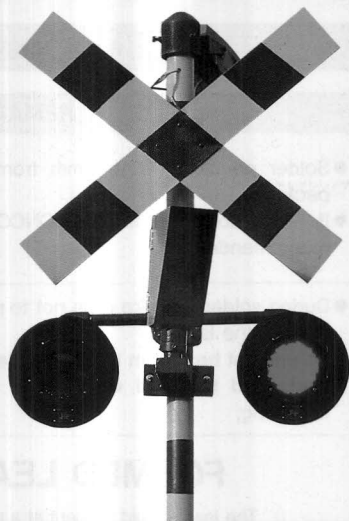
Sensors

The sensor devices boasting of high reliability, include high-level output, high-speed infrared LEDs and highly sensitive photo diodes.

They are used in a range of important products and many types of equipment such as remote controls, rotary encoders, photo interrupters, reflection sensors, floppy disk detectors and camera auto-focus elements

■ Page 54/55/56/57/58/59





Traffic Equipment

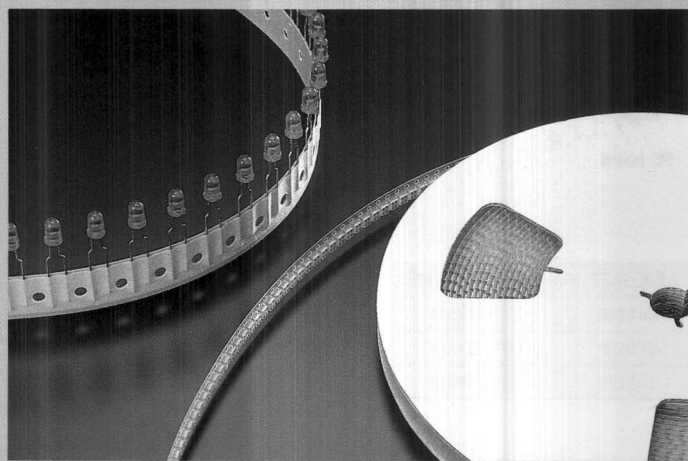
The Stanley super-bright LEDs boast of being the world's brightest and offer the maximum in long service life and low power consumption.

In the field of traffic safety, Stanley LEDs passed the regulations for American highway safety standards and were realized as the world leader for use as high-mount stop lamps in vehicles to prevent rear-end collisions.

They are also widely used for railroad signal and safety lamps.

■ Page 52

Taping Specifications

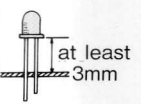
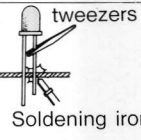


The lead type LEDs and chip type LEDs are included as standard products in the taping types line-up.

Our taped LEDs can be used for high-density mounting and large parts insertion machines.

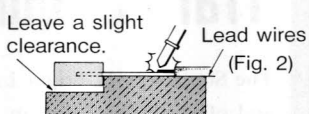
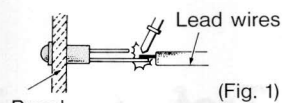
Stanley is also capable in services of lead forming and luminous intensity selection.

Taped LEDs:	Lead LED	P28
	Chip LED	P30/P31

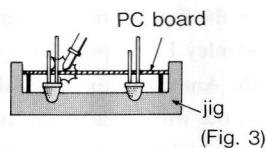
METHOD	SOLDERING CONDITIONS	REMARKS
DIP SOLDERING	Bath temperature : $260 \pm 5^{\circ}\text{C}$ Immersion time : within 5 sec	- Solder no closer than 3mm from the base of the package. - If using soldering flux, "LONCO RESIN FLUX" is recommended. 
SOLDERING IRON	Soldering iron : 30W or smaller Temperature at tip of iron : 300°C or lower Soldering time : within 3 sen	- During soldering, take care not to press the tip of iron against the lead. - To prevent heat from being transferred directly to the lead, hold the lead with a pair of tweezers while Soldering. 

SOLDERING

- When soldering the leads of LEDs in a condition that the package is fixed with a panel(See Fig. 1), be careful not to stress the leads with iron tip.
- When soldering wire to the lead work with a jig(See Fig. 2)to avoid stressing the package.



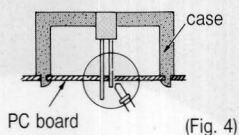
- Similarly, when a jig is used to solder the LED to the PC board, take care as much as possible to avoid stressing the leads. (See Fig. 3)



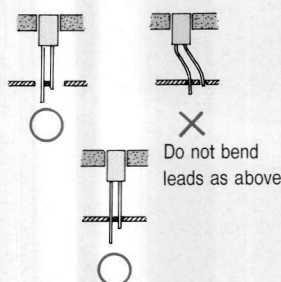
- Repositioning after soldering should be avoided as much as possible. If inevitable, be sure to preserve the soldering conditions with irons stated above:select a best-suited method that assures the least stress to the LED.
- Lead cutting after soldering should be performed only after the LED temperature has returned to normal temperature.

LED MOUNTING METHOD

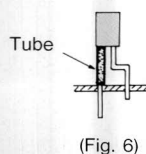
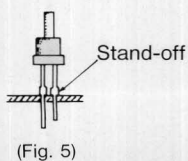
- When mounting the LED by using a case, as shown Fig. 4, ensure that the mounting holes on the PC board match the pitch of the leads correctly-Tolerance of dimensions of the respective components including the LED should be taken into account especially when designing the case, PC board, etc. To prevent pitch misalignment between the leads and board holes, the diameter of the board holes should be slightly larger than the size of the lead. Alternatively, the shape of the holes should be made oval. (See Fig. 4)



LEAD SIZE	DIAMETER OF BOARD HOLES
□0.4mm	$\phi 0.7 \sim 1.0\text{mm}$
□0.5mm	$\phi 0.8 \sim 1.0\text{mm}$
□0.6mm	$\phi 1.0 \sim 1.3\text{mm}$

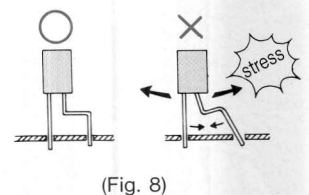
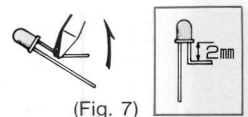


- Use LEDs with stand-off(Fig. 5)or the tube or spacer made of resin (Fig.6)to position the LEDs.



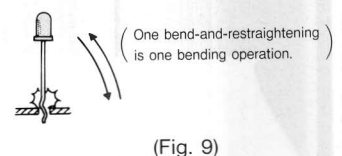
FORMED LEAD

- The lead should be bent at a point located at least 2mm away from the package. Bending should be performed with base firmly fixed by means of a jig or radio pliers. (Fig. 7)
- Forming lead should be carried out prior to soldering and never during or after soldering.
- Form the lead to ensure alignment between the leads and the hole on board, so that stress against the LED is prevented. (Fig. 8)

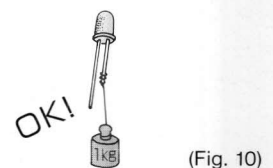


LEAD STRENGTH

- Bend strength
Do not bend the lead more than twice. (Fig. 9)



- Tensile strength
If the force is 1kg or less, there will be no problem. (At room temperature)



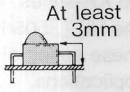
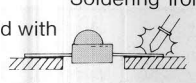
HANDLING PRECAUTIONS

Although rigid against vibration, the LEDs may be damaged or scratched if dropped. So take care when handling.

* Reliability test has been performed to confirm vibration resistance of LED at conditions of 10 G : 100~2000Hz, 2 hours each at X, Y and Z axes.

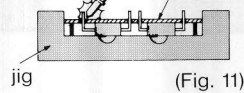
INSTRUCTIONS FOR USING LEDs

(Axial lead types)

METHOD	SOLDERING CONDITIONS	REMARKS
DIP SOLDERING	Bath temperature : $260 \pm 5^{\circ}\text{C}$ Immersion time : within 5 sec	- Solder no closer than 3 mm from the base of package - If using soldering flux, "LONCO RESIN FLUX" is recommended.  At least 3mm
SOLDERING IRON	Soldering iron : 30W or smaller Temperature at tip of iron: 300°C or lower Soldering time : within 3 sec	During soldering, be careful not to stress the lead with the iron tip.  Soldering iron

1 SOLDERING

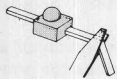
- Lead cutting after soldering should be performed only after the LED temperature has returned to normal room temperature.
- Repositioning of the LED should not be performed immediately after soldering wait until the LED has naturally cooled down. Be sure to preserve the soldering conditions with soldering iron stated above.
- When using a jig to solder LED to the PC board, work carefully not to stress the leads with the jig. (Fig. 11)



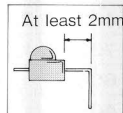
(Fig. 11)

2 LEAD FORMING

- Bend the lead no closer than 2mm from the package. To avoid stressing the package directly, hold the lead in place either with a jig or a pair of radio pliers. (Fig. 12)



(Fig. 12)

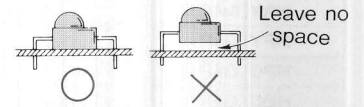


- Lead forming should be performed prior to soldering, but never after or during soldering.

3 LED MOUNTING METHOD

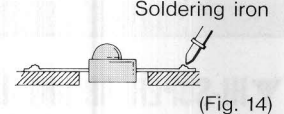
- To avoid stressing the LED, take the following precautions.

- Be sure that no space exists between the LED and PC board, (Fig. 13)



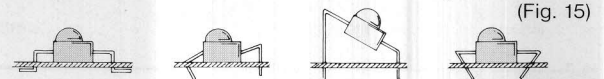
(Fig. 13)

- Position the LED with some aids, such as countersunk section in the PC board. This prevents stress from being applied to the leads. (Fig. 14)



(Fig. 14)

- Be sure not mount the LEDs in conditions as shown in Fig. 15



(Fig. 15)

- If necessary to fix the LED on the PC board to prevent it from being displaced during soldering, apply the best suited way to minimize the stress to the LED according to the counting manner.

INSTRUCTIONS FOR USING LEDs

(Chip type)

METHOD	SOLDERING CONDITIONS	REMARKS
DIP SOLDERING	Bath temperature : $260 \pm 5^{\circ}\text{C}$ Immersion time : within 5 sec.	- Pre-heating of the parts to be soldered: 120°C or lower, within 2minutes. "LONCO RESIN FLUX" is recommended if soldering flux is used.
SOLDERING IRON	soldering iron : 30W or smaller Temperature at iron tip : 300°C or lower Soldering time: within 3 sec.	- The soldering iron tip should be less than 1 mm in diameter and coated wire type solder(inside flux)less than 0.5 mm dia. - Use solder having a melting point less than 200°C.
REFLOW SOLDERING	Pre-heating of the parts to be soldered: Temp: 120°C or lower, Time: within 2 minutes Operation temperature: 240°C or lower, within 5 sec.	Be sure to avoid extreme heat or cold.

INSTRUCTIONS FOR USING LEDs

CHEMICAL RESISTANCE

- Avoid exposure to chemicals as it may attack the LED surface and cause discoloration.
- When washing is required, refer to the following table for the proper chemical to be used. (Immersion time: within 3 minutes at room temperature.)

SOLVENT	ADAPTABILITY
Freon TE	⊙
Chloroethene	×
Isopropyl alcohol	⊙
Thinner	×
Acetone	×
Trichloroethylene	×

⊙.....Usable.

×.....Do not use.

- NOTE Influences of ultrasonic cleaning on the LED resin body differ depending on such factors as the oscillator output, size of the PC board and the way in which the LED is mounted. Therefore, ultrasonic cleaning should only be performed after confirming there is no problem by conducting a test under practical conditions.

HI-SUPER BRIGHT LED.

Stanley's Hi-super bright LEDs represent the world's most advanced LED technology. For 660 nm Red, select the H-series, (GaAlAs/DH structure) the KR-series (GaAlAs/DH structure) which has a wide distribution angle and the ER-series (GaAlAs/SH structure).

The H□□5066X series feature hi-super bright pure green, green, yellow and orange. The 5034X series have been added for the sign board use. These series of super-bright LEDs provide intensity levels which enable their use in automotive, traffic signal, sign board and numerous other applications.

▼ CHARACTERISTICS BY COLOR

 $T_a = 25^\circ\text{C}$

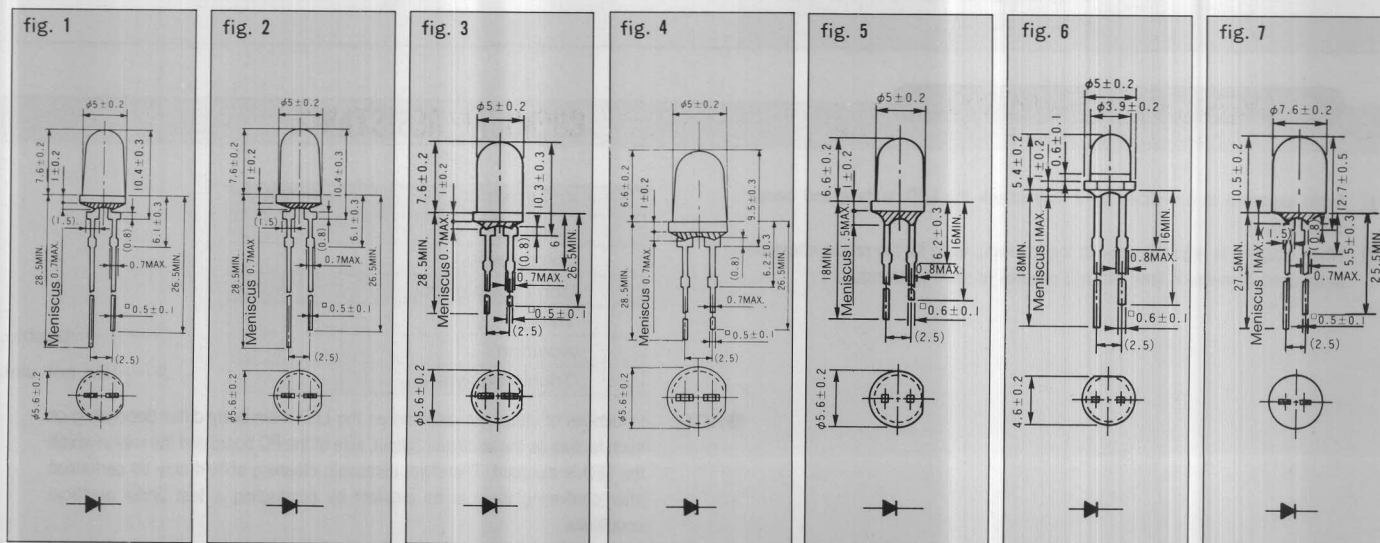
Type No.	Material	Emitted Color	Absolute Maximum Ratings						Electro-Optical Characteristics								
			Power Dissipation	Forward Current	Peak Forward Current	Reverse Voltage	Operating Temp	Storage Temp	Forward Voltage V _F			Reverse Current I _R		Capacitance	peak λ _p	Spectral Line Half Width Δλ	
			P _d	I _F	I _{FM}	V _R	T _{opr}	T _{stg}	TYP.	MAX.	I _F	MAX.	V _R	C _o	λ _p TYP.	Δλ TYP.	I _F
H/KR	GaAlAs	Red	125	50	300	4	-30~+85	-30~+100	1.8	2.5	20	100	4	50	660	25	20
ER/HBR	GaAlAs		100	50	300	4	-30~+85	-30~+100	1.7	2.0	20	100	4	50	660	30	20
HAA	GaAsP/GaP	Orange	125	50	100	4	-30~+85	-30~+100	2.2	2.5	20	20	4	50	605	30	20
HAY	GaAsP/GaP	Yellow	125	50	100	4	-30~+85	-30~+100	2.2	2.5	20	20	4	40	580	30	20
HPY	GaP		125	50	100	4	-30~+85	-30~+100	2.1	2.5	20	20	4	40	570	30	20
HPG	GaP	Green	125	50	100	4	-30~+85	-30~+100	2.1	2.5	20	20	4	40	560	30	20
HBG	GaP	Pure Green	125	50	100	4	-30~+85	-30~+100	2.1	2.5	20	20	4	50	555	30	20
Units			mW	mA	mA	V	°C	°C	V		mA	μA	V	pF	nm		mA

▼HI-SUPER BRIGHT LED

 $T_a = 25^\circ\text{C}$

Shape	Type No.	Emitted Color	Lens		Peak Wave length λ_p (nm)	Luminous Intensity Iv (mcd)			Features	fig.
						MIN.	TYP.	I_F (mA)		
	H-3000-L	Red	Water Clear		660	2,400	3,000	20	■ This is the world's brightest super-bright red LED. ■ General indicator and light sources for photosensor Outdoor Signboards	1
	H-2000-L				660	1,400	2,000	20		
	H-1000-L				660	700	1,000	20		
	ER-700-L				660	600	700	20		
	ER-500-L				660	400	500	20		
	ER-300-L				660	200	300	20		
	HBR5066X	Red	Pastel Red	Clear	660	200	300	20	■ Pastel Color Packages Indoor Signboards	2
	HAA5066X	Orange	Pastel Orange		605	160	250	20		
	HAY5066X	Yellow	Pastel Yellow		580	100	150	20		
	HPY5066X				570	200	300	20		
	HPG5066X	Green	Pastel Green		560	150	200	20		
	HBG5066X	Pure Green	Pastel Green		555	100	150	20		

▼ **PACKAGE DIMENSIONS** Unit: mm



▼ WIDE VIEWING ANGLE LED

Ta=25°C

Shape	Type No.	Emitted Color	Lens	Peak Wave length λ_p (nm)	Luminous Intensity(mcd) Iv			Features	fig.
					MIN.	TYP.	I _F (mA)		
	KR5004X	Red	Water Clear	660	400	800	20	■ Wide viewing angle	3
	KR5005S	Red	Water Clear	660	200	300	20	Outdoor Signboards	4
	KR5505S			660	200	300	20		5
	KR4505S	Red	Water Clear	660	100	200	20	■ Wide viewing angle ■ Light sources for handy sensors	6

▼ SIGNBOARD LAMP LED

Ta=25°C

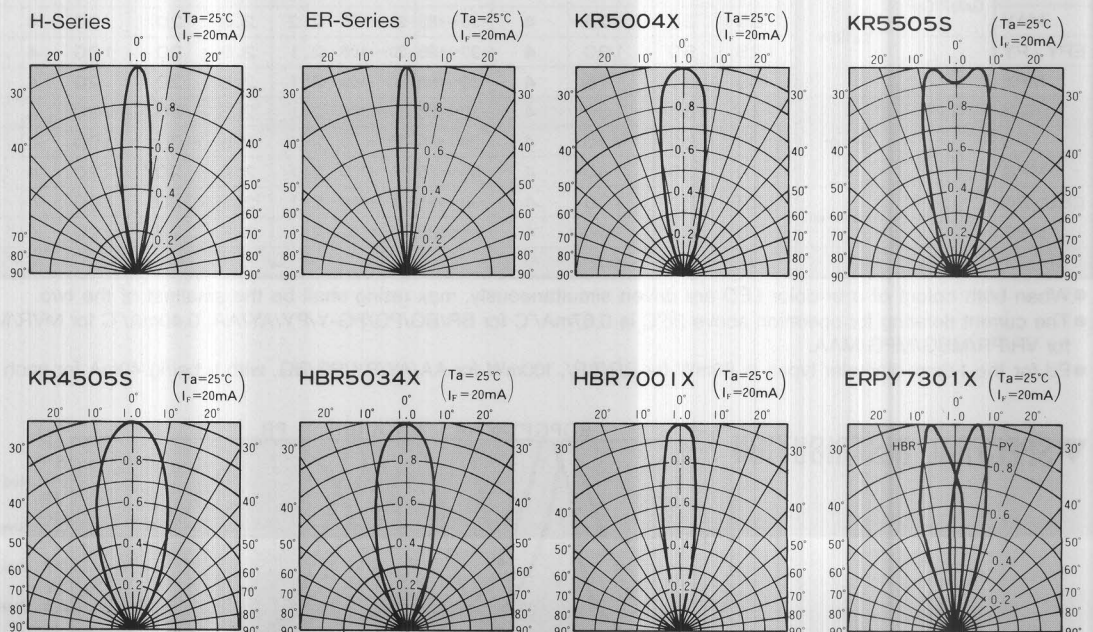
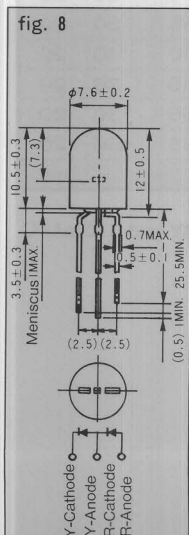
Shape	Type No.	Emitted Color	Lens		Peak Wave length λ_p (nm)	Luminous Intensity(mcd) Iv			Features	fig.
						MIN.	TYP.	I _F (mA)		
	HBR5034X	Red	Red	Diffused	660	50	75	20	■ Wide viewing angle	3
	EBR5034X	Red	Red	Diffused	660	25	50	20	Indoor Signboards	

▼ LARGE-SIZE LED

Ta=25°C

Shape	Type No.	Emitted Color	Lens		Peak Wave length λ_p (nm)	Luminous Intensity(mcd) Iv			Features	fig.
						MIN.	TYP.	I _F (mA)		
	KR7001X	Red	Water Clear		660	500	1,000	20	■ Available in tape	7
	HBR7001X	Red	Water Clear		660	200	400	20	Outdoor Signboards	
	HBR7071X	Red	Pastel Red	Diffused	660	30	60	20	■ Available in tape	
	HPY7071X	Yellow	Pastel Yellow	Diffused	570	30	60	20	Indoor Signboards	
	ERPY7301X	Red	Water Clear		660	100	200	20	■ Outdoor Signboards	8
		Yellow			570	100	200	20	Outdoor Signboards	

▼ SPATIAL DISTRIBUTION



SUPER BRIGHT LED

▼DESCRIPTION ON TYPE NO.

B R 5 0 6 4 X
① ② ③ ④ ⑤ ⑥

①LED DIE MATERIAL(CHIP)

Ta=25°C

Material	GaAlAs, Gap, GaAsP/GaP (Super Bright Type)	GaAsP	GaP	GaP (Low Current Type)	GaAsP/GaP	GaAsP/GaP (Low Current Type)
Emitted color						
Red	EBR/BR	AR	PR	MPR	VR	MVR
Orange	EAA	—	—	—	AA	MAA
Yellow	EAY/EPY	—	PY	MPY	AY	MAY
Green	—	—	PG/PG-Y	MPG	—	—
Pure Green	EBG	—	BG	MBG	—	—

※The low-current types(M□□)are suitable for static drives.

②PACKAGE SIZE

2=1.5~2.4mm 3=2.5~3.4mm 4=3.5~4.4mm 5=4.5~5.4mm 7=6.5~7.6mm

③LEAD CONSTRUCTON

0=0.5mm square long lead with stand off and reflector 1=0.6mm square lead with stand off 2=Axial lead 3=0.5mm square long Lead with reflector/
three lead type/side view type 4=0.4mm square lead. 5=0.6mm square lead with reflector 6=0.4mm square lead with reflector 7=0.6mm square
long lead with reflector 8=0.4m square long lead with reflector 9=0.4mm square long lead

④PACKAGE COLOR

0=Water clear 1=white diffused 2=Color clear 3=Color diffused 4=White surface diffused 5=Color surface diffused
6=Pastel color clear 7=Pastel color diffused 8=Pastel color surface diffused

⑤SHAPE CODE

⑥OUTER SHAPE SUFFIX

S. X.=Round T=Triangle K=Rectangular D=Chimney(debeso) F=Side view

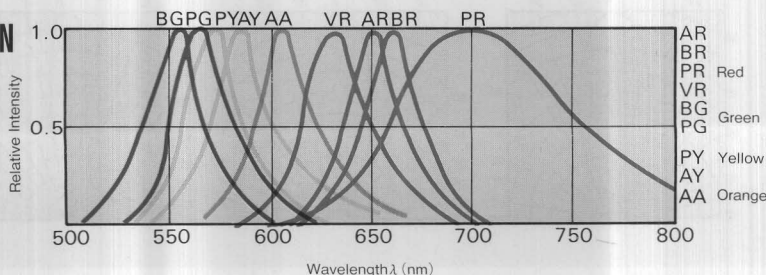
▼CHARACTERISTICS BY COLOR

Ta=25°C

Type No.	Material	Emitted Color	Absolute Maximum Ratings						Electro-Optical Characteristics								
			Power Dissipation	Forward Current	Peak Foward Current	Reverse Voltage	Operating Temp	Storage Temp	Forward Voltage V _F			Reverse Current I _R		Capacitance	Wavelength		
			Pd	I _F	I _{FM}	V _R	T _{opr}	T _{stg}	TYP.	MAX.	I _F	MAX.	V _R	C _o	peak λ _p TYP.	Spectral Line Half Width Δλ TYP.	I _F
EBR / BR	GaAlAs	Red	100	50	300	4	-30~+85	-30~+100	1.7	2.0	20	100	4	50	660	30	20
VR	GaAsP/GaP		75	30	100	4	-30~+85	-30~+100	2.0	2.5	20	100	4	35	630	30	20
MVR	GaP		75	30	75	4	-30~+85	-30~+100	2.0	2.8	20	20	4	10	630	30	20
PR			75	30	100	4	-30~+85	-30~+100	2.1	2.5	10	100	4	70	700	100	10
MPR			75	30	75	4	-30~+85	-30~+100	2.1	2.8	10	20	4	40	700	100	10
AR	GaAsP		100	50	300	4	-30~+85	-30~+100	1.7	2.0	20	100	4	40	650	30	20
EAA / AA	GaAsP/GaP	Orange	125	50	100	4	-30~+85	-30~+100	2.2	2.5	20	100	4	50	605	30	20
MAA			70	25	60	4	-30~+85	-30~+100	2.2	2.8	20	20	4	10	605	30	20
EAY / AY	GaAsP/GaP	Yellow	125	50	100	4	-30~+85	-30~+100	2.2	2.5	20	100	4	40	580	30	20
MAY	GaP		85	30	75	4	-30~+85	-30~+100	2.2	2.8	20	20	4	10	580	30	20
EPY / PY			125	50	100	4	-30~+85	-30~+100	2.1	2.5	20	100	4	40	570	30	20
MPY			85	30	75	4	-30~+85	-30~+100	2.1	2.8	20	20	4	20	570	30	20
PG-Y	GaP	Green	125	50	100	4	-30~+85	-30~+100	2.1	2.5	20	100	4	40	565	30	20
PG	GaP		125	50	100	4	-30~+85	-30~+100	2.1	2.5	20	100	4	40	560	30	20
MPG			70	25	60	4	-30~+85	-30~+100	2.1	2.8	20	20	4	25	560	30	20
EBG/BG	GaP	Pure Green	125	50	100	4	-30~+85	-30~+100	2.1	2.5	20	100	4	50	555	30	20
MBG			70	25	60	4	-30~+85	-30~+100	2.1	2.8	20	20	4	25	555	30	20
Units			mW	mA	mA	V	°C	°C	V		mA	μA	V	pF	nm		mA

- When both colors of a bi-color LED are driven simultaneously, max rating shall be the smallest of the two.
- The current derating for operation above 25°C is 0.67mA/°C for BR/BG/PG/PG-Y/PY/AY/AA, 0.40mA/°C for MVR/MPR/MPY/MAY and 0.33mA/°C for VR/PR/MBG/MPG/MAA.
- Pd for the 1.6mm diameter types is 80mW for BR/AR/, 100mW for AA/AY/PY/PG/BG, with If being 40mA for each color.

▼SPECTRAL DISTRIBUTION



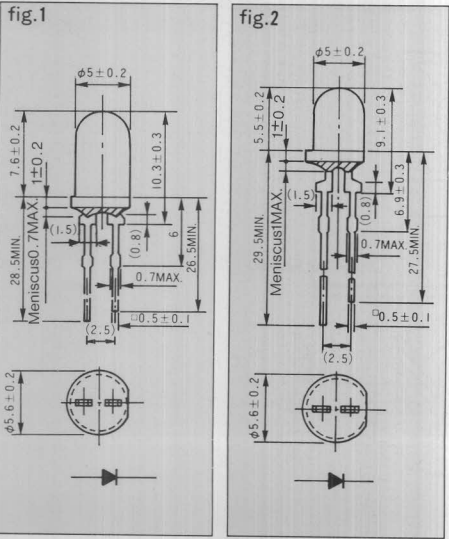
▼ROUND SHAPEφ5mm(T-1 3/4)TYPE LED

Ta=25°C

Shape	Type No.	Emitted Color	Lens	Peak Wave length λ_p (nm)	Luminous Intensity I_v (mcd)			Features	fig.				
					MIN.	TYP.	I_F (mA)						
	●BR5064X	Red	Pastel Red	Clear	660	60	120	20	■Low-current types ■For $\phi 5$ mm indicator ■Available in tape	1			
	●MVR5064X				630	50	100	20					
	●MPR5064X				700	5	10	10					
	●MAA5064X	Orange	Pastel Orange		605	50	100	20					
	●MAY5064X	Yellow	Pastel Yellow		580	40	80	20					
	●MPY5064X				570	60	120	20					
	●MPG5064X	Green	Pastel Green		560	50	100	20					
	●MBG5064X	Pure Green			555	20	40	20					
	●MVR5074X	Red	Pastel Red	Diffused	630	30	60	20			■Low-current types ■For $\phi 5$ mm indicator ■Available in tape	1	
	●MPR5074X				700	3	6	10					
	●MAA5074X	Orange	Pastel Orange		605	25	50	20					
	●MAY5074X	Yellow	Pastel Yellow		580	20	40	20					
	●MPY5074X				570	30	60	20					
	●MPG5074X	Green	Pastel Green		560	20	40	20					
	●MBG5074X	Pure Green			555	8	16	20					
		●BR5063X	Red		Pastel Red	Clear	660	15					30
●MVR5063X		630		10			20	20					
●MPR5063X		700		2			4	10					
●MAA5063X		Orange	Pastel Orange	605	10		20	20					
●MAY5063X		Yellow	Pastel Yellow		580		10	20	20				
●MPY5063X					570		15	30	20				
●MPG5063X		Green	Pastel Green		560		10	20	20				
●MBG5063X		Pure Green			555		5	10	20				
	●BR5073X	Red	Pastel Red	Diffused	660	6	12	20	■Low-current types ■For $\phi 5$ mm indicator ■Available in tape	2			
	●MVR5073X				630	5	10	20					
	●MPR5073X				700	1	2	10					
	●MAA5073X	Orange	Pastel Orange		605	5	10	20					
	●MAY5073X	Yellow	Pastel Yellow		580	5	10	20					
	●MPY5073X				570	6	12	20					
	●MPG5073X	Green	Pastel Green		560	5	10	20					
	●MBG5073X	Pure Green			555	1.5	3	20					

"●"mark stands for standard LEDs. Taping is applicable to all of them.

▼PACKAGE DIMENSIONS Unit:mm



SUPER BRIGHT LED

▼ROUND SHAPE $\phi 5\text{mm}$ (T-1 3/4)TYPE LED

Ta=25°C

Shape	Type No.	Emitted Color	Lens	Peak Wave length λ_p (nm)	Luminous Intensity Iv(mcd)			Features	fig.	
					MIN.	TYP.	If (mA)			
	●BR5362X	Red	Pastel Red	Clear	660	2	4	20	■ Side emitting ■ Usable with a reflector for surface illumination ■ Available in tape For AV Equipment For OA Equipment	3
	●VR5362X				630	2	4	20		
	●PR5362X				700	0.4	0.6	10		
	●AA5362X	Orange	Pastel Orange		605	2	4	20		
	●AY5362X	Yellow	Pastel Yellow		580	2	4	20		
	●PY5362X				570	2	4	20		
	●PG5362X	Green	Pastel Green		560	2	4	20		
	●BG5362X	Pure Green			555	0.6	1.2	20		
	※●EBR/BR5007S	Red	Water Clear	660	10/5	15/10	20	■ ϕ 5mm flat lens ■ Usable with a reflector for surface illumination ■ Available in tape For OA Equipment	4	
	※●PR5007S			700	0.6	1.2	10			
	※●AA5007S	Orange		605	3	6	20			
	※●AY5007S	Yellow		580	3	6	20			
	※●PY5007S			570	5	10	20			
	※●BG5007S	Pure Green		555	2	4	20			
	●BR5085X	Red	Pastel Red	Surface Diffused	660	3	6	20	■ ϕ 5mm surface indicator ■ Flat emitting surface ■ Available in tape For AV Equipment	5
	●VR5085X				630	3	6	20		
	●PR5085X				700	0.6	0.9	10		
	●AA5085X	Orange	Pastel Orange		605	3	6	20		
	●AY5085X	Yellow	Pastel Yellow		580	2.5	5	20		
	●PY5085X				570	3	6	20		
	●PG5085X	Green	Pastel Green		560	2.5	5	20		
	●BG5085X	Pure Green			555	0.8	1.6	20		

“●”mark stands for standard LEDs. Taping is applicable to all of them.

※:Type numbers are revised, refer to the attached list. (P60~62)

▼PACKAGE DIMENSIONS Unit:mm

fig.3

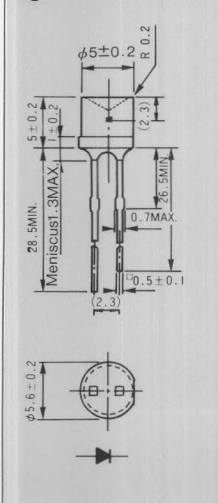


fig.4

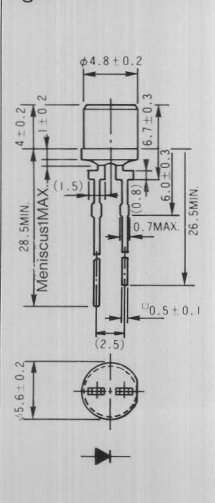
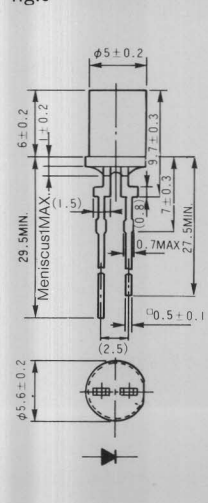
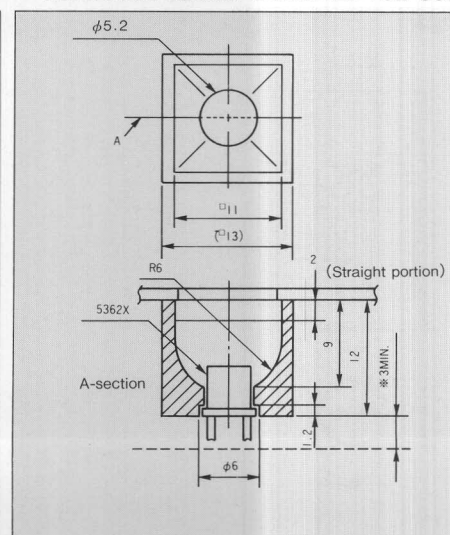


fig.5



▼REFLECTOR DESIGN EXAMPLES FOR 5362X



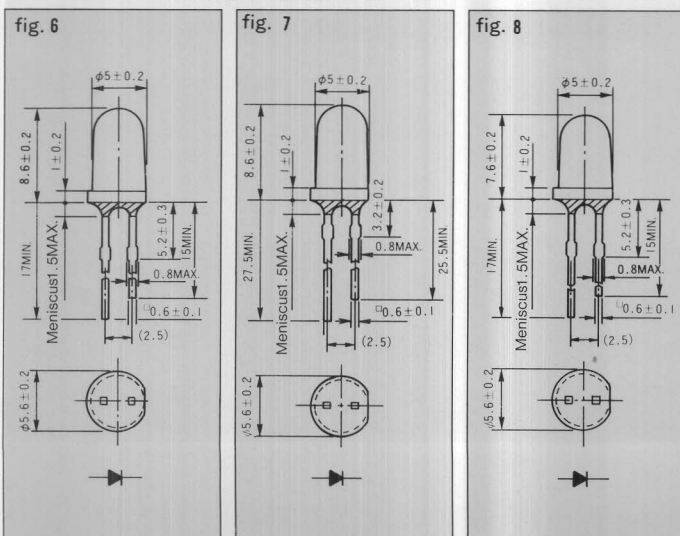
▼ ROUND SHAPE $\phi 5\text{mm}$ (T-1 3/4)TYPE LED

Ta=25°C

Shape	Type No.	Emitted Color	Lens	Peak Wave length λ_p (nm)	Luminous Intensity I _v (mcd)			Features	fig.	
					MIN.	TYP.	I _F (mA)			
	※EBR/ BR5504S	Red	Water Clear	660	80/40	160/80	20	■ E□□ are extra super-bright types. ■ Pin point indicator: $\phi 5\text{mm}$ ■ Long lead type (57□4S) is available in tape (fig.7)	6 (7)	
	※PR5504S			700	6	12	10			
	※AR5504S			650	3	6	20			
	※EAA/ AA5504S	Orange		605	60/30	90/60	20			
	※EAY/ AY5504S	Yellow		580	60/30	90/60	20			
	※EPY/ PY5504S			570	80/40	160/80	20			
	※EBG/ BG5504S	Pure Green		555	50/20	80/40	20			
	※EBR/ BR5534S	Red	Red	660	20/8	30/20	20			
	※PR5534S		Diffused	700	3	6	10			
	※AR5534S			650	1.5	3	20			
	※EAA/ AA5534S	Orange	Orange	605	16/8	24/16	20			
	※EAY/ AY5534S	Yellow	Yellow	580	16/8	24/16	20			
	※EPY/ PY5534S		570	30/15	45/30	20				
	※PG5534SY	Green	Green	565	12	24	20			
※EBG/ BG5534S	Pure Green	555		8/5	12/8	20				
	※EBR/ BR5505S	Red	Water Clear	660	20/10	40/20	20	■ E□□ are extra super-bright types ■ Wide viewing angle ■ Pin point indicator : $\phi 5\text{mm}$		8
	※PR5505S			700	4	8	10			
	※AR5505S			650	2	4	20			
	※EAA/ AA5505S	Orange		605	30/15	45/30	20			
	※EAY/ AY5505S	Yellow		580	30/15	45/30	20			
	※EPY/ PY5505S			570	50/25	75/50	20			
	※EBG/ BG5505S	Pure Green		555	12/6	18/12	20			
	※EBR/ BR5535S	Red	Red	660	12/6	18/12	20			
	※PR5535S		Diffused	700	2.5	5	10			
	※AR5535S			650	1.2	2.4	20			
	※EAA/ AA5535S	Orange	Orange	605	20/8	30/20	20			
	※EAY/ AY5535S	Yellow	Yellow	580	20/8	30/20	20			
	※EPY/ PY5535S		570	30/15	45/30	20				
	※PG5535SY	Green	Green	565	12	24	20			
※EBG/ BG5535S	Pure Green	555		8/4	12/8	20				

※:Type numbers are revised, refer to the attached list. (P60~62)

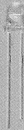
▼ PACKAGE DIMENSIONS Unit:mm



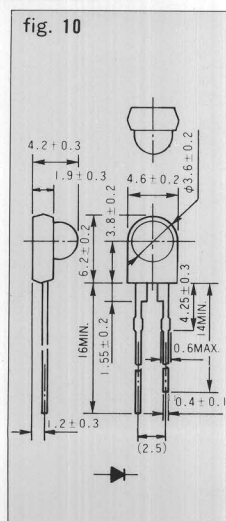
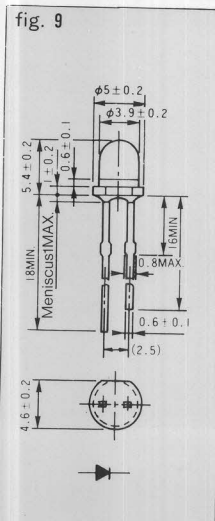
SUPER BRIGHT LED

▼ ROUND SHAPE $\phi 4\text{mm}$ TYPE LED/SIDE VIEW TYPE

Ta=25°C

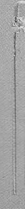
Shape	Type No.	Emitted Color	Lens	Peak Wave length λ_p (nm)	Luminous Intensity I _v (mcd)			Features	fig.	
					MIN.	TYP.	I _F (mA)			
	BR4565S	Red	Pastel Red	Clear	660	10	20	■ For $\phi 4\text{mm}$ surface illumination ■ Low-current types	9	
	MVR4565S				630	8	16			
	MPR4565S				700	1.5	3			
	MAA4565S	Orange	Pastel Orange		605	10	20			
	MAY4565S				580	10	20			
	MPY4565S	Yellow	Pastel Yellow		570	15	30			
	MPG4565S				Pastel Green		560			10
	MBG4565S	Pure Green	555				5			10
	BR4575S	Red	Pastel Red	Diffused	660	6	12	■ Side view type $\phi 3.6\text{mm}$ ■ Low-current types ■ For operational indicator		
	MVR4575S				630	5	10			
	MPR4575S				700	0.6	1.2			
	MAA4575S	Orange	Pastel Orange		605	4	8			
	MAY4575S				580	4	8			
	MPY4575S	Yellow	Pastel Yellow		570	8	16			
	MPG4575S				Pastel Green		560			6
	MBG4575S	Pure Green	555				3			6
	BR4361F	Red	Pastel Red	Clear	660	10	20	■ Side view type $\phi 3.6\text{mm}$ ■ Low-current types ■ For operational indicator	10	
	MVR4361F				630	4	8			
	MPR4361F				700	0.6	1.2			
	MAA4361F	Orange	Pastel Orange		605	5	10			
	MAY4361F				580	5	10			
	MPY4361F	Yellow	Pastel Yellow		570	6	12			
	MPG4361F				Pastel Green		560			5
	MBG4361F	Pure Green	555				3			6
	BR4371F	Red	Pastel Red	Diffused	660	5	10	■ Side view type $\phi 3.6\text{mm}$ ■ Low-current types ■ For operational indicator		
	MVR4371F				630	3	6			
	MPR4371F				700	0.5	1			
	MAA4371F	Orange	Pastel Orange		605	4	8			
	MAY4371F				580	4	8			
	MPY4371F	Yellow	Pastel Yellow		570	5	10			
	MPG4371F				Pastel Green		560			3
	MBG4371F	Pure Green	555				1.5			3

▼ PACKAGE DIMENSIONS Unit:mm



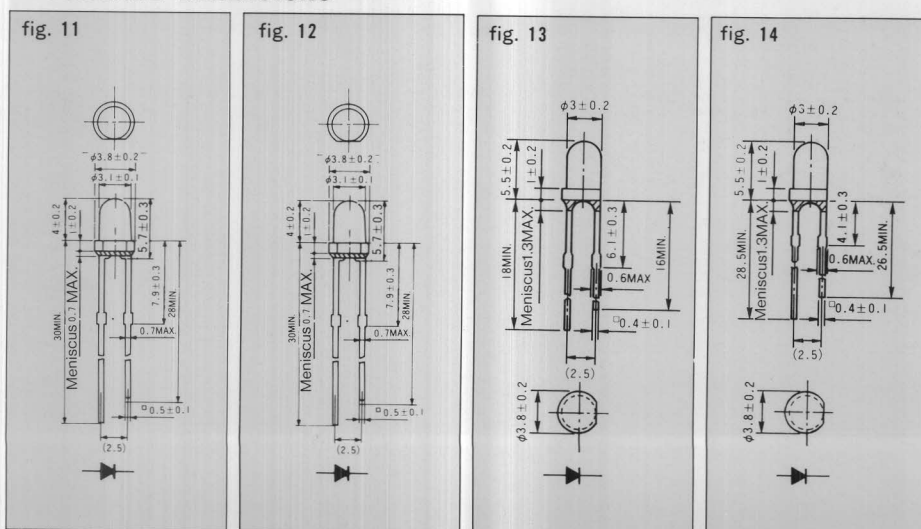
▼ ROUND SHAPE $\phi 3\text{mm}$ (T-1)TYPE LED

Ta=25°C

Shape	Type No.	Emitted Color	Lens		Peak Wave length λ_p (nm)	Luminous Intensity I _v (mcd)			Features	fig.			
						MIN.	TYP.	I _F (mA)					
	BR3338S	Red	Red	Diffused	660	15	30	20	■ Pin point indicator: $\phi 3$ ■ Long lead type ■ Available in tape ■ Low-current type	11			
	MVR3338S				630	10	20	20					
	MPR3338S				700	1.5	3	10					
	MAA3338S	Orange	Orange		605	10	20	20					
	MAY3338S	Yellow	Yellow		580	10	20	20					
	MPY3338S				570	15	30	20					
	MPG3338S	Green	Green		560	10	20	20					
	MBG3338S	Pure Green			555	4	8	20					
	BR3368S	Red	Pastel Red	Clear	660	40	80	20	■ Pin point indicator: $\phi 3$ ■ Available in tape ■ Low-current type	12			
	MVR3368S				630	20	40	20					
	MPR3368S				700	3	6	10					
	MAA3368S	Orange	Pastel Orange		605	20	40	20					
	MAY3368S	Yellow	Pastel Yellow		580	20	40	20					
	MPY3368S				570	30	60	20					
	MPG3368S	Green	Pastel Green		560	20	40	20					
	MBG3368S	Pure Green			555	10	20	20					
	BR3378S	Red	Pastel Red	Diffused	660	15	30	20	For AV Equipment	13			
	MVR3378S				630	10	20	20					
	MPR3378S				700	1.5	3	10					
	MAA3378S	Orange	Pastel Orange		605	10	20	20					
	MAY3378S	Yellow	Pastel Yellow		580	10	20	20					
	MPY3378S				570	15	30	20					
	MPG3378S	Green	Pastel Green		560	10	20	20					
	MBG3378S	Pure Green			555	5	10	20					
	※ EBR / BR3402S	Red	Water Clear		660	30/15	60/30	20	■ E □ □ are an extra super-bright types ■ Pin point indicator : $\phi 3\text{mm}$ ■ Long lead type (39□ 2S) is also available (Fig. 14)	13 (14)			
	※ PR3402S				700	2.5	5	10					
	※ AR3402S				650	2.5	5	20					
	※ EAA / AA3402S	Orange			605	16/8	24/16	20					
	※ EAY / AY3402S	Yellow			580	16/8	24/16	20					
	※ EPY / PY3402S				570	24/12	48/24	20					
	※ EBG / BG3402S	Green			555	10/5	15/10	20					
		※ EBR / BR3432S			Red	Red	Diffused	660			24/12	48/24	20
※ PR3432S		700	1					2			10		
※ AR3432S		650	1					2			20		
※ EAA / AA3432S		Orange	Orange		605	12/6		18/12			20		
※ EAY / AY3432S		Yellow	Yellow		580	12/6		18/12			20		
※ EPY / PY3432S					570	20/10		30/20			20		
※ PG3432SY		Green	Green		565	7		14			20		
※ EBG / BG3432S		Pure Green	555		4/2	8/4		20					

※: Type numbers are revised, refer to the attached list. (P60~62)

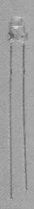
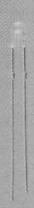
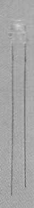
▼ PACKAGE DIMENSIONS Unit: mm



SUPER BRIGHT LED

▼ ROUND SHAPE $\phi 3\text{mm}$ (T-1)TYPE LED

Ta=25°C

Shape	Type No.	Emitted Color	Lens	Peak Wave length λ_p (nm)	Luminous Intensity Iv(mcd)			Features	fig.		
					MIN.	TYP.	I _F (mA)				
	●BR3361X	Red	Pastel Red	Clear	660	6	12	20	■ Wide viewing angle ■ Low current type ■ For $\phi 3$ mm indicator ■ Available in tape	15	
	●MVR3361X				630	4	8	20			
	●MPR3361X				700	0.8	1.6	10			
	●MAA3361X	Orange	Pastel Orange		605	6	12	20			
	●MAY3361X				580	5	10	20			
	●MPY3361X	Yellow	Pastel Yellow		570	10	20	20			
	●MPG3361X				560	6	12	20			
	●MBG3361X	Pure Green	Pastel Green		555	3	6	20			
	●BR3371X	Red	Pastel Red	Diffused	660	5	10	20	For OA Equipment		
	●MVR3371X				630	3	6	20			
	●MPR3371X				700	0.5	1	10			
	●MAA3371X	Orange	Pastel Orange		605	5	10	20			
	●MAY3371X				580	4	8	20			
	●MPY3371X	Yellow	Pastel Yellow		570	8	16	20			
	●MPG3371X				560	5	10	20			
	●MBG3371X	Pure green	Pastel Green		555	2	4	20			
	BR3867S	Red	Pastel Red	Clear	660	2.5	5	20	■ Wide viewing angle ■ For $\phi 3$ mm surface illumination ■ Low current type ■ Available in tape	16	
	MVR3867S				630	2	4	20			
	MPR3867S				700	0.5	1	10			
	MAA3867S	Orange	Pastel Orange		605	2.5	5	20			
	MAY3867S				580	2.5	5	20			
	MPY3867S	Yellow	Pastel Yellow		570	3	6	20			
	MPG3867S				560	2.5	5	20			
	MBG3867S	Pure Green	Pastel Green		555	1.2	2.4	20			
	BR3877S	Red	Pastel Red	Diffused	660	2	4	20	For OA Equipment		
	MVR3877S				630	1.5	3	20			
	MPR3877S				700	0.4	0.8	10			
	MAA3877S	Orange	Pastel Orange		605	2	4	20			
	MAY3877S				580	2	4	20			
	MPY3877S	Yellow	Pastel Yellow		570	2.5	5	20			
	MPG3877S				560	2	4	20			
	MBG3877S	Pure Green	Pastel Green		555	1	2	20			

"●"mark stands for standard LEDs. Taping is applicable to all of them.

▼ PACKAGE DIMENSIONS Unit:mm

fig. 15

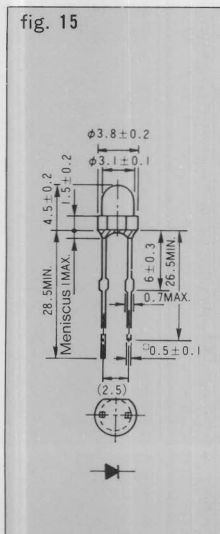
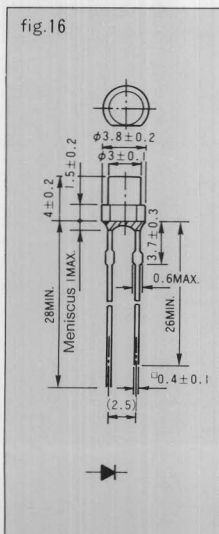
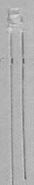


fig.16



▼ROUND SHAPE $\phi 3\text{mm}$ (T-1)TYPE LED

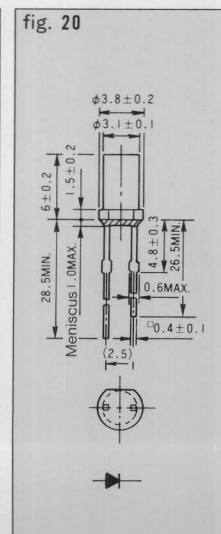
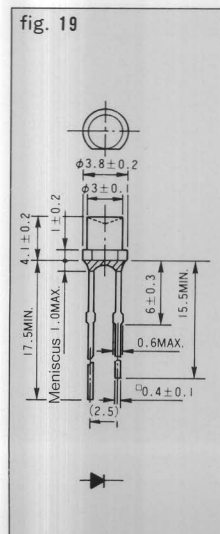
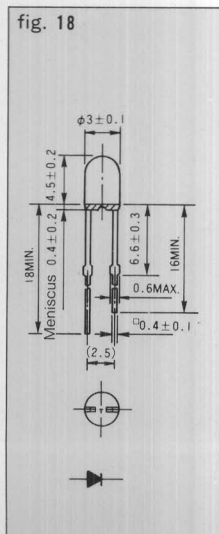
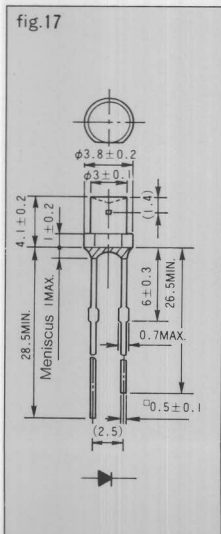
Ta=25°C

Shape	Type No.	Emitted Color	Lens	Peak Wave length λ_p (nm)	Luminous Intensity Iv(mcd)			Features	fig.	
					MIN.	TYP.	If (mA)			
	●BR3365S	Red	Pastel Red	Clear	660	2.5	5	20	■ Side emitting ■ Usable with a reflector for surface illumination ■ Available in tape For AV Equipment For OA Equipment	17
	●VR3365S				630	2	4	20		
	●PR3365S				700	0.4	0.8	10		
	●AA3365S	Orange	Pastel Orange		605	2	4	20		
	●AY3365S	Yellow	Pastel Yellow		580	2	4	20		
	●PY3365S				570	3	6	20		
	●PG3365S				560	2	4	20		
	●BG3365S	Pure Green	Pastel Green		555	0.8	1.6	20		
	※EBR / BR3403S	Red	Water Clear	660	12/6	18/12	20	■ E□□ are an extra super-bright types ■ Pin point indicator : $\phi 3\text{mm}$ ■ Wide viewing angle	18	
	※PR3403S			700	0.6	1.2	10			
	※EAA / AA3403S	Orange		605	6/3	9/6	20			
	※EAY / AY3403S	Yellow		580	6/3	9/6	20			
	※EPY / PY3403S			570	10/5	15/10	20			
	※EBG / BG3403S			Pure Green	555	2.4/1.2	3.6/2.4			20
	※EBR / BR3433S	Red	Red	Diffused	660	10/5	15/10	20		
	※PR3433S				700	0.5	0.8	10		
	※EAA / AA3433S	Orange	Orange		605	5/2.5	8/5	20		
	※EAY / AY3433S	Yellow	Yellow		580	5/2.5	8/5	20		
	※EPY / PY3433S				570	8/4	12/8	20		
	※PG3433SY				565	3	6	20		
※EBG / BG3433S	Pure Green	Green	555	1.6/0.8	2.4/1.6	20				
	BR3665S	Red	Pastel Red	Clear	660	1.5	3	20	■ Side emitting ■ Usable with a reflector for surface illumination For AV Equipment For OA Equipment	19
	VR3665S				630	1.5	3	20		
	PR3665S				700	0.4	0.8	10		
	AA3665S	Orange	Pastel Orange		605	1.5	3	20		
	AY3665S	Yellow	Pastel Yellow		580	1.5	3	20		
	PY3665S				570	1.5	3	20		
	PG3665S				560	1.5	3	20		
	BG3665S	Pure Green	Pastel Green		555	0.5	1	20		
	BR3889S	Red	Pastel Red	Surface Diffused	660	4	8	20	■ $\phi 3\text{mm}$ surface indicator ■ Available in tape ■ Flat surface type	20
	VR3889S				630	3	6	20		
	PR3889S				700	0.6	0.9	10		
	AA3889S	Orange	Pastel Orange		605	2.5	5	20		
	AY3889S	Yellow	Pastel Yellow		580	2	4	20		
	PY3889S				570	2.5	5	20		
	PG3889S				560	2	4	20		
	BG3889S	Pure Green	Pastel Green		555	0.8	1.6	20		

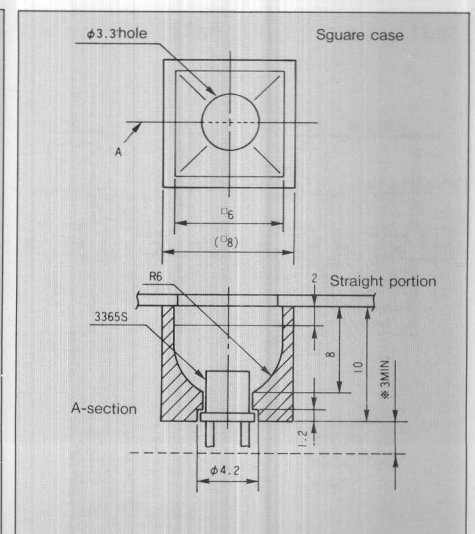
●"Mark stands for standard LEDs. Taping is applicable to all of them.

※:Type numbers are revised, refer to the attached list. (P60~62)

▼PACKAGE DIMENSIONS Unit:mm



▼REFLECTOR DESIGN EXAMPLE FOR THE 3365S



SUPER BRIGHT LED

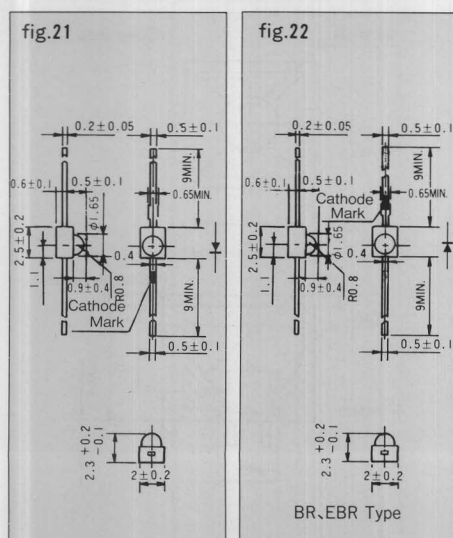
▼FLAT PACKAGE $\phi 1.6\text{mm}$ (T-5/8)TYPE LED

Ta=25°C

Shape	Type No.	Emitted Color	Lens	Peak Wave length λ_p (nm)	Luminous Intensity Iv(mcd)			Features	fig.		
					MIN.	TYP.	I _F (mA)				
	BR2262S	Red	Pastel Red	Clear	660	10	20	■ Very compact flat pack- age with ϕ 1.6mm lens ■ Axial lead type ■ BR has reversed polarity (fig.22)			
	MVR2262S				630	8	16				
	MPR2262S				700	0.8	1.6				
	MAA2262S	Orange	Pastel Orange		605	8	16				
	MAY2262S				580	8	16				
	MPY2262S	Yellow	Pastel Yellow		570	12	24				
	MPG2262S				560	8	16				
	MBG2262S	Pure Green	Pastel Green		555	4	8				
	※BR2272S	Red	Pastel Red	Diffused	660	8	16	For AV Equipment For OA Equipment	21 (22)		
	MVR2272S				630	6	12				
	※MPR2272S				700	0.6	1.2				
	※MAA2272S	Orange	Pastel Orange		605	6	12				
	※MAY2272S				580	5	10				
	※MPY2272S	Yellow	Pastel Yellow		570	8	16				
	※MPG2272S				560	6	12				
	※MBG2272S	Pure Green	Pastel Green		555	2	4				
	※EBR / BR2202S	Red	Water Clear		660	4/2	8/4	■ Very compact flat pack- age with ϕ 1.6mm lens ■ Axial lead type ■ EBR is an extra super bright type ■ EBR/BR has reversed polarity(fig.22)			
	※PR2202S				700	0.8	1.6				
	※AR2202S				650	1	2				
	※AA2202S	Orange			Orange		605			1.2	2.4
	※AY2202S						580			1	2
	※PY2202S	Yellow			Yellow		570			2	4
	※BG2202S						555			1	2
		※EBR / BR2222S			Red	Red	Clear			660	4/2
※PR2222S		700	0.8	1.6							
※AR2222S		650	1	2							
※AA2222S		Orange	Orange		605	1.2		2.4			
※AY2222S					580	1		2			
※PY2222S		Yellow	Yellow		570	2		4			
※PG2222SY					565	1.5		3			
※BG2222S		Pure Green	Green	555	1	2					

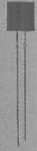
※:Type numbers are revised, refer to the attached list. (P60~62)

▼PACKAGE DIMENSIONS Unit:mm



▼ RECTANGULAR TYPE LED

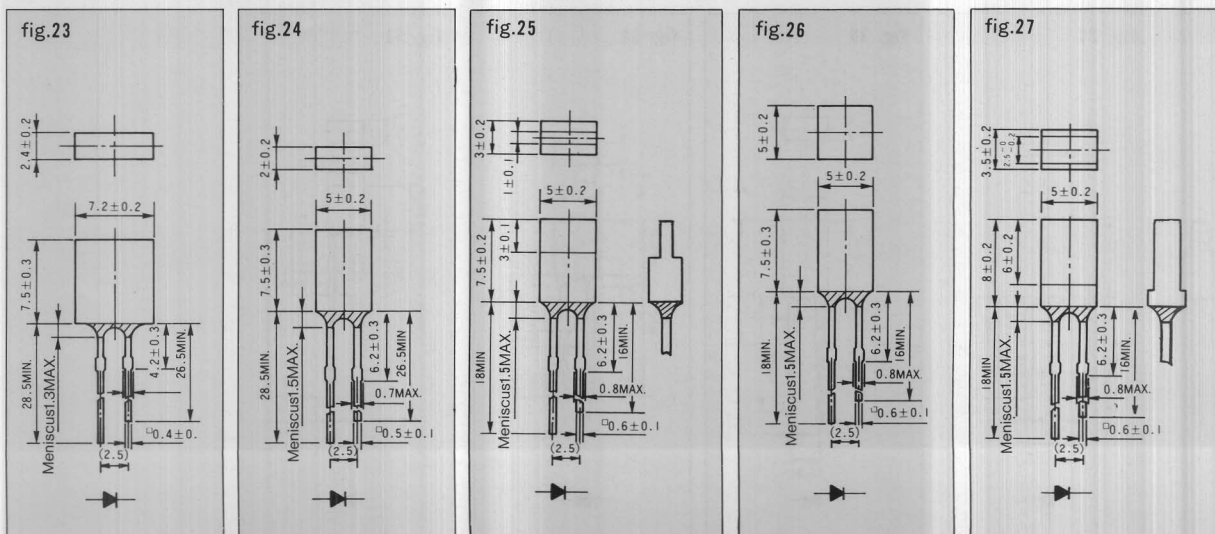
Ta=25°C

Shape	Type No.	Emitted Color	Lens		Peak Wave length λ_p (nm)	Luminous Intensity Iv(mcd)			Features	fig.
						MIN.	TYP.	I _F (mA)		
	※BR7851K	Red	Red	Surface Diffused	660	1.5	3	20	■Light emitting surface 2.4×7.2mm ■Available in tape For OA Equipment For AV Equipment	23
	※PR7851K				700	0.3	0.5	10		
	※AA7851K	Orange	Orange		605	1.2	2.4	20		
	※AY7851K	Yellow	Yellow		580	1.2	2.4	20		
	※PY7851K				570	2	4	20		
	※PG7851KY	Green	Green		565	1.5	3	20		
	※BG7851K	Pure Green			555	0.5	1	20		
	※●EBR/BR5351K	Red	Red	Surface Diffused	660	3/1.5	4.5/3	20	■E□□ is an extra super-bright type ■Light emitting surface 2×5mm ■Available in tape For OA Equipment For AV Equipment	24
	※●PR5351K				700	0.3	0.5	10		
	※●AA5351K	Orange	Orange		605	1.2	2.4	20		
	※●AY5351K	Yellow	Yellow		580	1.2	2.4	20		
	※●PY5351K				570	2	4	20		
	※●PG5351KY	Green	Green		565	1.5	3	20		
	※●BG5351K	Pure Green			555	0.5	1	20		
	※PR5552K	Red	Red	Surface Diffused	700	0.3	0.5	10	■Light emitting surface 1×5mm For OA Equipment For AV Equipment	25
	※AA5552K	Orange	Orange		605	1.2	2.4	20		
	※AY5552K	Yellow	Yellow		580	1.2	2.4	20		
	※PY5552K				570	2	4	20		
	※PG5552KY	Green	Green		565	1.5	3	20		
	※BG5552K	Pure Green			555	0.5	1	20		
	※BR5553K	Red	Red	Surface Diffused	660	1.5	3	20	■Light emitting surface 5×5mm ■Uniform light emission For OA Equipment For AV Equipment	26
	※PR5553K				700	0.3	0.5	10		
	※AA5553K	Orange	Orange		605	1.2	2.4	20		
	※AY5553K	Yellow	Yellow		580	1.2	2.4	20		
	※PY5553K				570	2	4	20		
	※PG5553KY	Green	Green		565	1.5	3	20		
	※BG5553K	Pure Green			555	0.5	1	20		
		※PR5556K	Red		Red	Surface Diffused	700	0.3		
※AA5556K		Orange	Orange	605	1		2	20		
※AY5556K		Yellow	Yellow	580	1		2	20		
※PY5556K				570	1.5		3	20		
※PG5556KY		Green	Green	565	1.5		3	20		
※BG5556K		Pure Green		555	0.4		0.8	20		

“●”mark stands for standard LEDs. Taping is applicable to all of them.

※:Type numbers are revised, refer to the attached list. (P60~62)

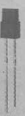
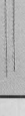
▼ PACKAGE DIMENSIONS Unit:mm



SUPER BRIGHT LED

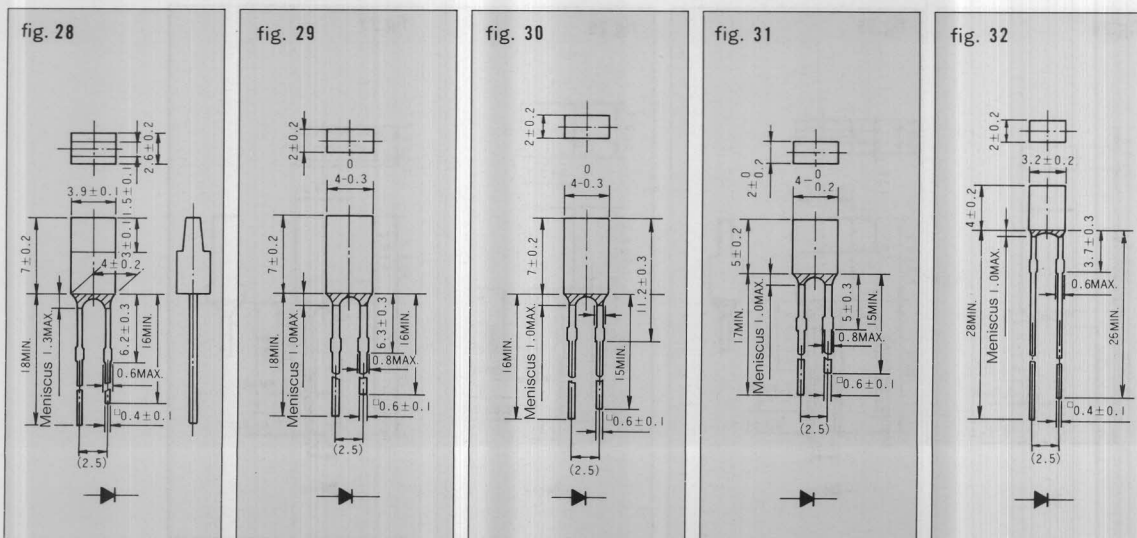
▼ RECTANGULAR TYPE LED

Ta=25°C

Shape	Type No.	Emitted Color	Lens	Peak Wave length λ_p (nm)	Luminous Intensity Iv(mcd)			Features	fig.
					MIN.	TYP.	If (mA)		
	※PR4652K	Red	Red	700	0.4	0.6	10	■ Light emitting surface 1.5×4mm	28
	※AA4652K	Orange	Orange	605	1.5	3	20		
	※AY4652K	Yellow	Yellow	580	1.5	3	20		
	※PY4652K		Yellow	570	2	4	20		
	※PG4652KY	Green	Green	565	1.5	3	20		
	※BG4652K	Pure Green		555	0.6	1.2	20		
	BR4553K	Red	Red	660	1.5	3	20	■ Light emitting surface 2×4mm	29
	PR4553K		Red	700	0.3	0.5	10		
	AA4553K	Orange	Orange	605	1	2	20		
	AY4553K	Yellow	Yellow	580	1	2	20		
	PY4553K		Yellow	570	2	4	20		
	PG4553KY	Green	Green	565	1.5	3	20		
	BG4553K	Pure Green		555	0.5	1	20		
	BR4523K-5	Red	Red	660	3	6	20	■ Light emitting surface 2×4mm ■ Surface illumination	30
	PR4523K-5		Red	700	0.8	1.6	10		
	AA4523K-5	Orange	Orange	605	2	4	20		
	AY4523K-5	Yellow	Yellow	580	2	4	20		
	PY4523K-5		Yellow	570	3	6	20		
	BG4523K-5	Pure Green	Green	555	1.5	3	20		
	BR4524K	Red	Red	660	3	6	20	■ Light emitting surface 2×4mm ■ Surface illumination	31
	PR4524K		Red	700	1	1.5	10		
	AA4524K	Orange	Orange	605	3	6	20		
	AY4524K	Yellow	Yellow	580	3	6	20		
	PY4524K		Yellow	570	5	10	20		
	BG4524K	Pure Green	Green	555	1.5	3	20		
	BR3822K	Red	Red	660	2	4	20	■ Light emitting surface 2×3mm ■ Surface illumination ■ Available in tape	32
	PR3822K		Red	700	0.4	0.8	10		
	AA3822K	Orange	Orange	605	2	4	20		
	AY3822K	Yellow	Yellow	580	2	4	20		
	PY3822K		Yellow	570	2	4	20		
	BG3822K	Pure Green	Green	555	1	2	20		

※:Type numbers are revised, refer to the attached list. (P60~62)

▼ PACKAGE DIMENSIONS Unit:mm



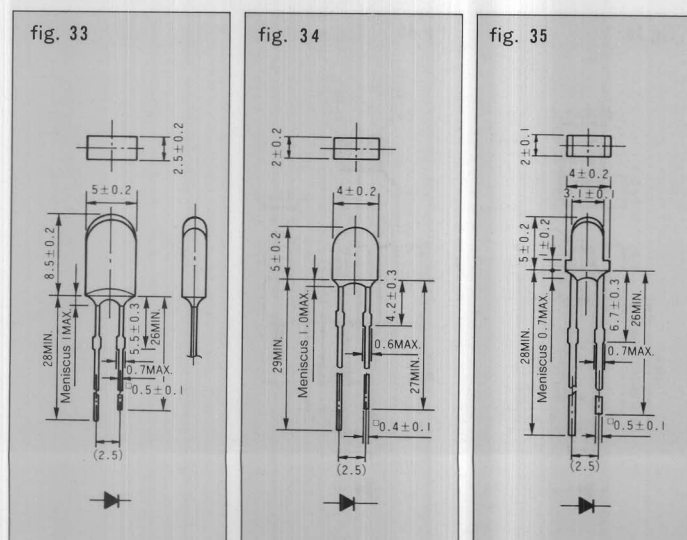
▼SEMI-ROUND SHAPE TYPE LED

Ta=25°C

Shape	Type No.	Emitted Color	Lens	Peak Wave length λ_p (nm)	Luminous Intensity Iv(mcd)			Features	fig.	
					MIN.	TYP.	I _F (mA)			
	●BR5379K	Red	Pastel Red	Diffused	660	12	24	20	■Light emitting surface 2.5X5mm ■Surface illumination ■Slim line package with semi-round shape ■Low-current type ■Available in tape For OA Equipment For AV Equipment	33
	●MVR5379K				630	10	20	20		
	●MPR5379K				700	1.5	3	10		
	●MAA5379K	Orange	Pastel Orange		605	12	24	20		
	●MAY5379K	Yellow	Pastel Yellow		580	12	24	20		
	●MPY5379K				570	20	40	20		
	●MPG5379K	Green	Pastel Green		560	12	24	20		
	●MBG5379K	Pure Green			555	3	6	20		
	BR4868K	Red	Pastel Red	Clear	660	5	10	20	■Light emitting surface 2X4mm ■Surface illumination ■Slim-line package with semi-round shape ■Low current type ■Available in tape For OA Equipment For AV Equipment	34
	MVR4868K				630	4	8	20		
	MPR4868K				700	1	1.5	10		
	MAA4868K	Orange	Pastel Orange		605	5	10	20		
	MAY4868K	Yellow	Pastel Yellow		580	5	10	20		
	MPY4868K				570	6	12	20		
	MPG4868K	Green	Pastel Green		560	4	8	20		
	MBG4868K	Pure Green			555	2	4	20		
	BR3363K	Red	Pastel Red	Clear	660	10	20	20	■Light emitting surface 2X3mm ■Surface illumination ■Slim-line package with semi-round shape ■Low current type ■Available in tape For OA Equipment For AV Equipment	35
	MVR3363K				630	8	16	20		
	MPR3363K				700	2	4	10		
	MAA3363K	Orange	Pastel Orange		605	20	40	20		
	MAY3363K	Yellow	Pastel Yellow		580	20	40	20		
	MPY3363K				570	30	60	20		
	MPG3363K	Green	Pastel Green		560	15	30	20		
	MBG3363K	Pure Green			555	8	16	20		
	BR3373K	Red	Pastel Red	Diffused	660	8	16	20	For OA Equipment For AV Equipment	35
	MVR3373K				630	6	12	20		
	MPR3373K				700	1.5	3.0	10		
	MAA3373K	Orange	Pastel Orange		605	10	20	20		
	MAY3373K	Yellow	Pastel Yellow		580	10	20	20		
	MPY3373K				570	20	40	20		
	MPG3373K	Green	Pastel Green		560	10	20	20		
	MBG3373K	Pure Green			555	5	10	20		

●"mark stands for standard LEDs. Taping is applicable to all of them.

▼PACKAGE DIMENSIONS Unit:mm



SUPER BRIGHT LED

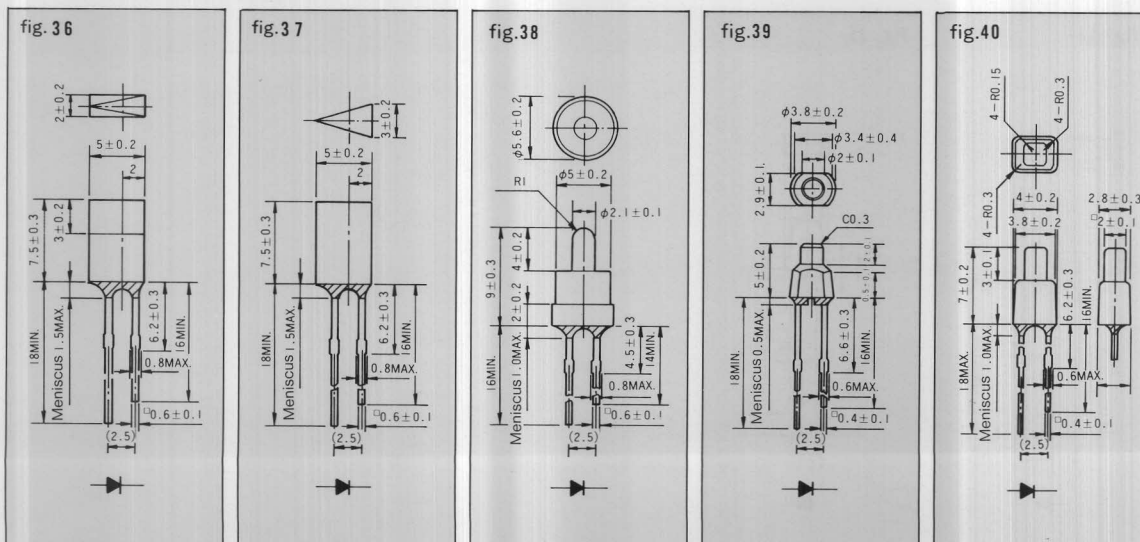
▼ TRIANGLE TYPE/CHIMNEY TYPE LED

Ta=25°C

Shape	Type No.	Emitted Color	Lens	Peak Wave length λ_p (nm)	Luminous Intensity I_v (mcd)			Features	fig.
					MIN.	TYP.	I_f (mA)		
	*PR5552T	Red	Red	700	0.3	0.5	10	■ Triangular light emitting surface: 2X5mm ■ Direction indicator For AV Equipment	36
	*AA5552T	Orange	Orange	605	1.2	2.4	20		
	*AY5552T	Yellow	Yellow	580	1.2	2.4	20		
	*PY5552T			570	2	4	20		
	*PG5552TY	Green	Green	565	1.5	3	20		
	*BG5552T	Pure Green		555	0.5	1	20		
	*PR5553T	Red	Red	700	0.3	0.5	10	■ Triangular light emitting surface: 3X5mm ■ Direction indicator For AV Equipment	37
	*AA5553T	Orange	Orange	605	1.2	2.4	20		
	*AY5553T	Yellow	Yellow	580	1.2	2.4	20		
	*PY5553T			570	2	4	20		
	*PG5553TY	Green	Green	565	1.5	3	20		
	*BG5553T	Pure Green		555	0.5	1	20		
	*PR2533D	Red	Red	700	0.5	1	10	■ Pin point indicator $\phi 2$	38
	*AA2533D	Orange	Orange	605	1.5	3	20		
	*AY2533D	Yellow	Yellow	580	1.5	3	20		
	*PG2533DY	Green	Green	565	2	4	20		
	*BG2533D	Pure Green		555	1	2	20		
	*BR2434D	Red	Red	660	2	4	20	■ Pin point indicator $\phi 2$ ■ Small package	39
	*PR2434D			700	0.3	0.6	10		
	*AA2434D	Orange	Orange	605	1.2	2.4	20		
	*AY2434D	Yellow	Yellow	580	1.2	2.4	20		
	*PY2434D			570	3	6	20		
	*PG2434DY	Green	Green	565	1.5	3	20		
	*BG2434D	Pure Green		555	0.6	1.2	20		
	PR2651K	Red	Red	700	0.3	0.5	10	■ Light emitting surface 2X2mm	40
	AA2651K	Orange	Orange	605	1	2	20		
	AY2651K	Yellow	Yellow	580	1	2	20		
	PY2651K			570	2	4	20		
	PG2651KY	Green	Green	565	1.5	3	20		
	BG2651K	Pure Green		555	0.4	0.8	20		

*:Type numbers are revised, refer to the attached list. (P60~62)

▼ PACKAGE DIMENSIONS Unit:mm



	SDB-505A-GD	Pure Green	Green Diffused	Metal	BG	1.0	2.0	20	5
	SDB-505B-RD	Red	Red Diffused		AR	1.0	2.0	20	
	SDB-505B-YD	Yellow	Yellow Diffused		AY	1.2	2.4	20	
	SDB-505B-GD	Pure Green	Green Diffused	Metal	BG	1.0	2.0	20	6
	SDB-505C-RD	Red	Red Diffused		AR	1.0	2.0	20	
	SDB-505C-YD	Yellow	Yellow Diffused		AY	1.2	2.4	20	
	SDB-505C-GD	Pure Green	Green Diffused		BG	1.0	2.0	20	

● For maximum ratings and electro-optical specifications, see the specifications and features for individual LEDs.

Bi-color Type

Ta=25°C

	Type No.	Emitted Color	Lens	Peak Wavelength λ_p (nm)	Absolute Maximum Ratings					Electro-Optical Characteristics							fig.	
					Forward Current I_F (mA)	Reverse Voltage V_R (V)	Power Dissipation P_d (mW)	Operating Temp. T_{opr} (°C)	Storage Temp. T_{stg} (°C)	Forward Voltage V_F (V)		Reverse Current I_R (μ A)		Luminous Intensity I_v (mcd)				
										TYP.	MAX.	I_F (mA)	MAX.	V_R (V)	MIN.	TYP.		I_v (mA)
	SDB-506-RG	Red Green	White Diffused	700 565	*30	3	*75	-30~+85	-30~+100	2.1	2.5	10	100	3	0.25	0.5	10	7
										2.1	2.8	20	100	3	0.5	1.0	20	

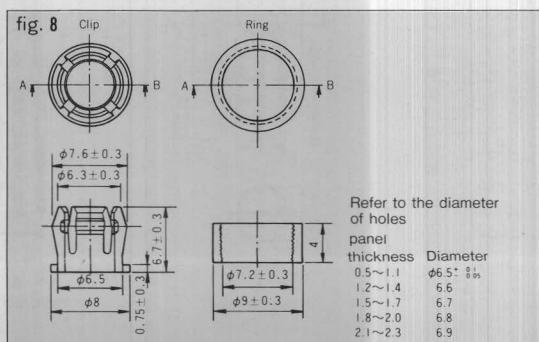
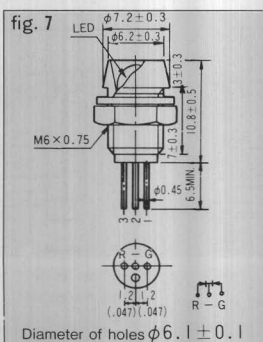
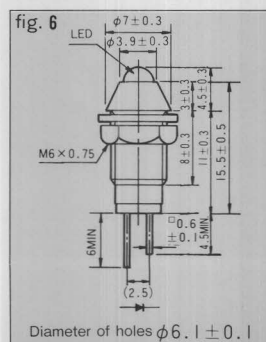
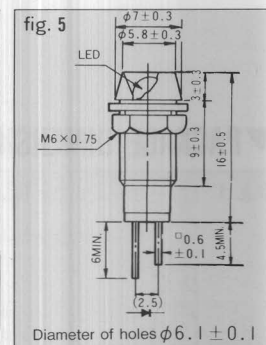
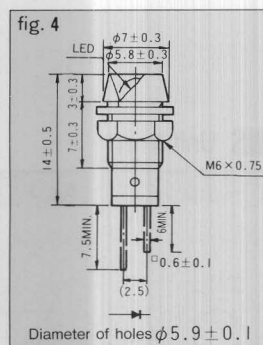
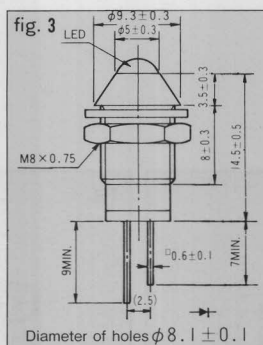
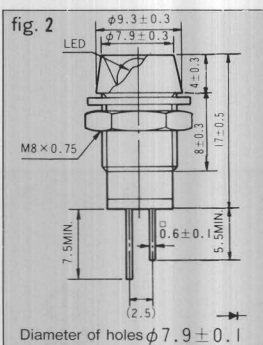
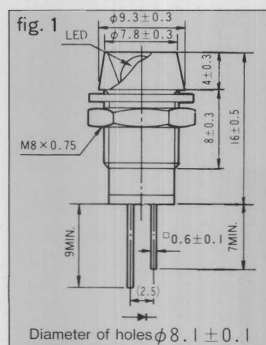
※Total ratings for two elements

▼CLIP AND RING FOR MOUNTING LED

Ta=25°C

	Applicable LEDs	Panel Thickness Range (mm)	Material		Color	fig.
			Clip	Ring		
	55□4S Round Type(ϕ 5mm)	0.5~2.3	Poly-Carbonate	Polypropylene	Black	8

▼PACKAGE DIMENSIONS Unit : mm



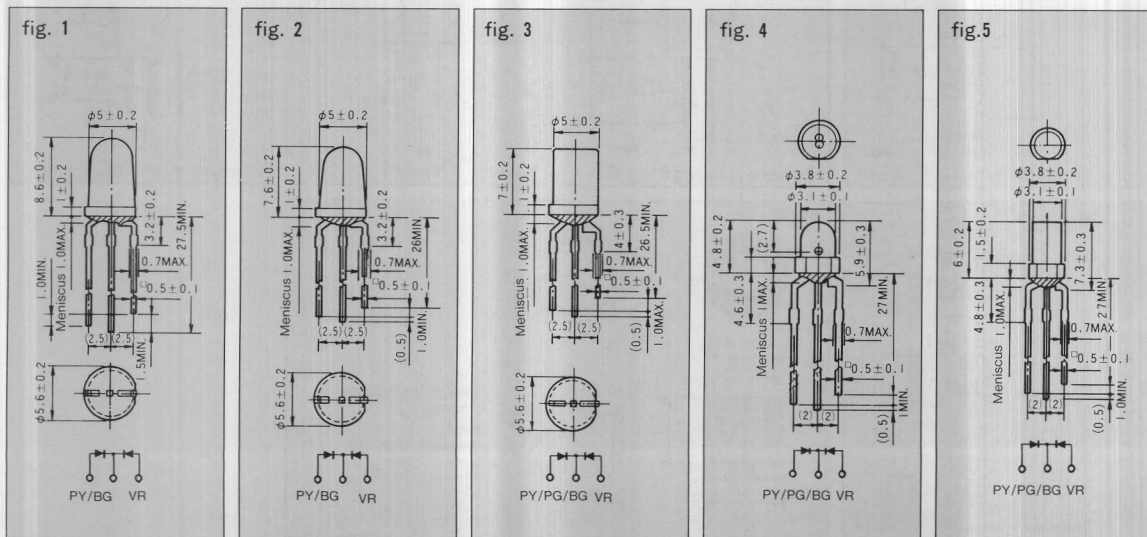
SUPER BRIGHT LED

▼ BI-COLOR TYPE LED

Ta=25°C

Shape	Type No.	Emitted Color	Lens		Peak Wave length λ_p (nm)	Luminous Intensity I_v (mcd)			Features	fig.
						MIN.	TYP.	I_F (mA)		
	VRPY5314S	Red	White Diffused	Diffused	630	10	20	20	■ Bi-color type with 3 leads in $\phi 5$ mm package For AV Equipment	1
		Yellow			570	12	24	20		
	VRBG5314S	Red			630	10	20	20		
		Pure Green			555	4	8	20		
	VRPY5315S	Red	White Diffused	Diffused	630	6	12	20	■ Bi-color type with 3 leads in $\phi 5$ mm package For AV Equipment	2
		Yellow			570	10	20	20		
	VRBG5315S	Red			630	6	12	20		
		Pure Green			555	3	6	20		
	VRPY5345X	Red	White Diffused	Surface Diffused	630	1.5	3	20	■ Bi-color type with 3 leads in $\phi 5$ mm package ■ Flat surface type Indoor Signboards	3
		Yellow			570	2	4	20		
	VRPG5345X	Red			630	1.5	3	20		
		Green			560	1.5	3	20		
	VRBG5345X	Red			630	1.5	3	20		
		Pure Green			555	0.8	1.6	20		
	VRPY3312X	Red	White Diffused	Diffused	630	4	8	20	■ Bi-color type with 3 leads in $\phi 3$ mm package For AV Equipment	4
		Yellow			570	8	16	20		
	VRPG3312X	Red			630	4	8	20		
		Green			560	6	12	20		
	VRBG3312X	Red			630	4	8	20		
		Pure Green			555	3	6	20		
	VRPY3349S	Red	White Diffused	Diffused	630	2	4	20	■ Bi-color type with 3 leads in $\phi 3$ mm package ■ Flat surface type For AV Equipment	5
		Yellow			570	3	6	20		
	VRPG3349S	Red			630	2	4	20		
		Green			560	2	4	20		
	VRBG3349S	Red			630	2	4	20		
		Pure Green			555	0.8	1.6	20		

▼ PACKAGE DIMENSIONS Unit: mm



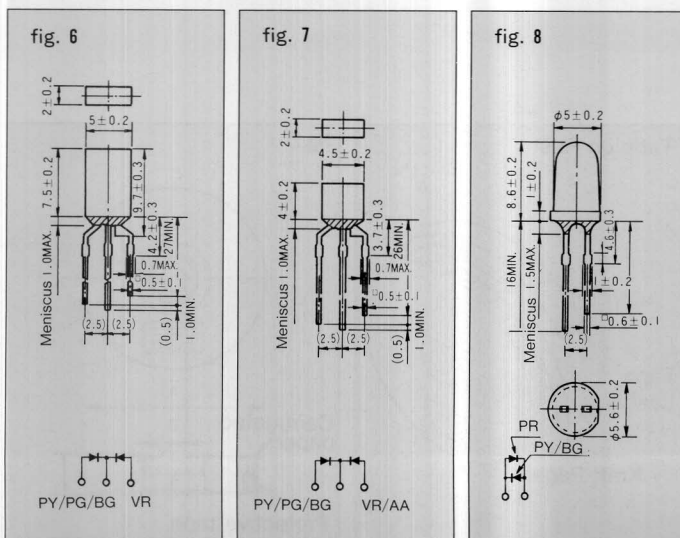
▼BI-COLOR TYPE LED

Ta=25°C

Shape	Type No.	Emitted Color	Lens	Peak Wave length λ_p (nm)	Luminous Intensity I_v (mcd)			Features	fig.
					MIN.	TYP.	I_F (mA)		
	VRPY5341K	Red	White Diffused	Surface Diffused	630	2	4	■Light emitting surface 2X5mm ■Bi-color type For OA Equipment For AV Equipment	6
		Yellow			570	2	4		
	VRPG5341K	Red			630	2	4		
		Green			560	2	4		
	VRBG5341K	Red			630	2	4		
		Pure Green			555	1	2		
	VRPY4307K	Red	Water Clear		630	2	4	■Light emitting surface 2X4.5mm ■Bi-color type ■Usable for surface illumination For AV Equipment	7
		Yellow			570	2	4		
	VRPG4307K	Red			630	2	4		
		Green			560	2	4		
	VRBG4307K	Red			630	2	4		
		Pure Green			555	1	2		
	AABG4307K	Orange			605	2	4		
		Pure green			555	1	2		
	※PRY5114S-1	Red	White Diffused	Diffused	700	1	2	■Pin point indicator: $\phi 5$ mm ■Bi-color type with 2 leads For AV Equipment	8
		Yellow			570	2.5	5		
	※PRG5114S-1	Red			700	1	2		
		Pure Green			555	2	4		

※:Type numbers are revised, refer to the attached list. (P60~62)

▼PACKAGE DIMENSIONS Unit:mm



SUPER BRIGHT LED

▼TAPED LED

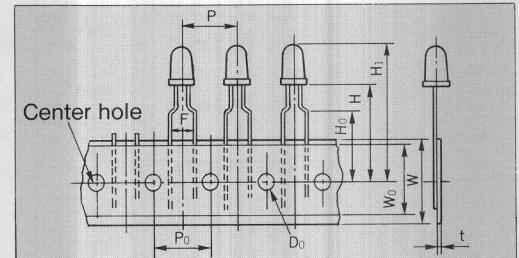
Stanley's taped LEDs can be used in either type of insertion machine, high-density mounting and large parts insertion machines. The taped LEDs are available in flat boxes(Folded Tape type)or on reels

▼TYPE NO. OF LED LAMPS FOR TAPING(Examples)

Type No. (Example)	Lead Size (mm)	Height Between Bottom of Package and Center of hole H (mm)
38□8S	□0.4	21~24.5
50□1K	□0.5	21~24
50□4S	□0.5	20~24
50□4X	□0.5	20~24
50□7S	□0.5	20~24

● The suitable lamps are listed in the LED features section

▼TAPING FIGURE



Items	(mm)	Straight Lead		Formed Lead	
		□0.4	□0.5	□0.4	□0.5
Pitch of Components	P	12.7	12.7	12.7	12.7
Pitch of Sprocket hole	Po	12.7	12.7	12.7	12.7
Lead to Lead Spacing	F	2.5	2.5	5.0	5.0
Height Between Bottom of Package and Center of hole	H	Refer to the above taping figure			
Stand-off Height	H0	—	—	16.0	16.0
Tape Width	W	18.0	18.0	18.0	18.0
Hold-Down Tape Width	W0	15.0	15.0	15.0	15.0
Sprocket Hole Diameter	φDo	4.0	4.0	4.0	4.0
Total Tape Thickness	t	0.58	0.58	0.58	0.58

● Other detailed specifications, conform to EIAJ-RC1008 standards

▼TAPING TYPES (Standard Specification Examples)

Folded Tape

Taping Type No.	Dimensions (mm)			Suitable LED(mm)		Quantity (in Each Box)	fig.
	L	H	W	Round	Rectangular		
J11	325	210	41	φ3	□3※	3,000pcs.	1
J22	325	280	42	φ5	□5※	2,500pcs.	

Tape on Reel

Taping Type No.	Dimensions (mm)			Suitable LED(mm)		Quantity (in Each Box)	fig.
	A	W	D	Round	Rectangular		
J55	360	52	30	φ3	□3※	2,200pcs.	2
J66	360	52	30	φ5	□5※	1,300pcs.	

● When ordering, specify type numbers(Ex:BR3908S-J11)

※Length of rectangular package

● J55 /J66 : possible to specify anode first or cathode first.

▼PACKAGING DIMENSIONS Unit:mm

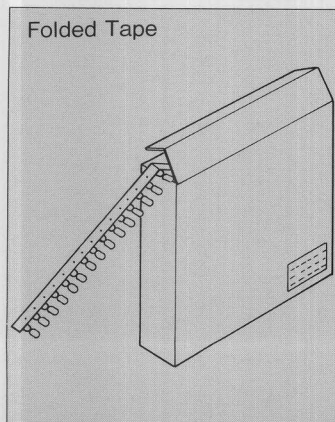
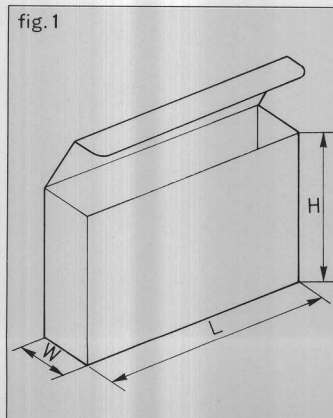


fig.1



Tape on Reel

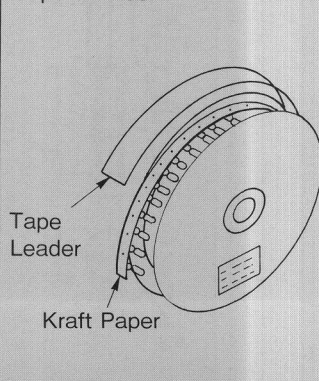
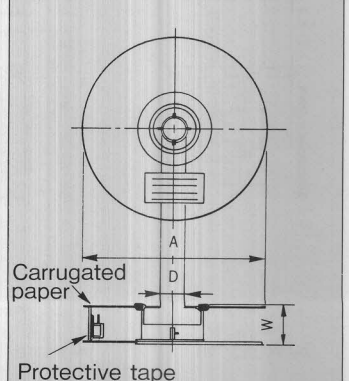


fig.2



CHIP LED FOR SURFACE MOUNTING

Chip LEDs were developed for surface mounting by contributing to both product compactness and economy. To meet a broad spectrum of application requirements, all colors and combinations are available, in addition to a variety of packages, providing a combination to suit virtually any situation.

▼DESCRIPTION ON TYPE NO.

BR 1 1 0 1 W TR

chip	Shape Chip Type	Number of chips	Package Color	Shape code of PCB	Material in taping	Orientation
BR-GaAlAs VR-GaAsP/GaP PR-GaP AA-GaAsP/GaP AY-GaAsP/GaP PY-GaP PG-GaP BG-GaP		1: One chip 2: Two chips	0: Water Clear	• Single Color 1: Flat Lens 2: Inner Lens • Bi-Color 1: Flat Lens 2: Dome Lens 3: Single Lens 4: Dual Lens	W: Glass epoxy	TR TL

▼CHARACTERISTICS BY COLOR

Ta=25°C

Type No.	Material (Emitted Color)	Absolute Maximum Rating						Electro-Optical Characteristics							
		Power Dissipation *Pd	Forward Current *If	Peak Forward Current *IFM	Reverse Voltage VR	Operating Temperature T _{opr}	Storage Temperature T _{stg}	Forward Voltage VF			Reverse Current IR		Wavelength		
								TYP.	MAX.	IF	MAX.	VR	Peak λp TYP.	Δλ TYP.	IF
BR	GaAlAs (Red)	60	30	70	4	-30~+85	-30~+90	1.7	2.0	20	100	4	660	30	20
VR	GaAsP/GaP (Red)	75	30	70	4	-30~+85	-30~+90	2.0	2.5	20	100	4	630	30	20
PR	GaP (Red)	75	30	70	4	-30~+85	-30~+90	2.1	2.5	10	100	4	700	100	10
AA	GaAsP/GaP (Orange)	75	30	70	4	-30~+85	-30~+90	2.2	2.5	20	100	4	605	30	20
AY	GaAsP/GaP (Yellow)	75	30	70	4	-30~+85	-30~+90	2.2	2.5	20	100	4	580	30	20
PY	GaP (Yellow)	75	30	70	4	-30~+85	-30~+90	2.1	2.5	20	100	4	570	30	20
PG	GaP (Green)	75	30	70	4	-30~+85	-30~+90	2.1	2.5	20	100	4	560	30	20
BG	GaP (Pure Green)	75	30	70	4	-30~+85	-30~+90	2.1	2.5	20	100	4	555	30	20
Units		mW	mA	mA	V		°C	V			mA	μA	V	nm	mA

● The current derating for operation above 25°C is 0.42mA/°C DC drive and 0.93mA/°C for Pulse drive.

● IFM applies for the condition $tw \leq 1\text{msec}$ and duty cycle $\leq 1/20$.

※ For two elements driven simultaneously, the absolute maximum ratings are $Pd=75\text{mW}$, $If=30\text{mA}$ and $IFM=70\text{mA}$.

▼CHARACTERISTICS BY SHAPE

Ta=25°C

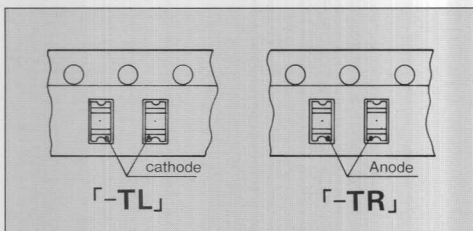
Shape	Type No.	Emitted color	Package Color	Peak Wave length (nm)	Luminous Intensity Iv (mcd)			Features	fig.
					MIN.	TYP.	IF (mA)		
	BR1101W	Red	Water Clear	660	1.6	4.5	20	■ Flat lens type ■ Wide distribution. ■ Ideal for back illumination	1
	VR1101W	Red		630	0.9	2.5	20		
	PR1101W	Red		700	0.4	0.7	10		
	AA1101W	Orange		605	1.0	3.6	20		
	AY1101W	Yellow		580	2.0	3.2	20		
	PY1101W	Yellow		570	1.4	4.0	20		
	PG1101W	Green		560	1.2	3.0	20		
	BG1101W	Pure Green		555	0.7	1.4	20		
	BR1102W	Red	Water Clear	660	6.0	17.0	20	■ Inner-Lens type ■ High-intensity achieved by the use of a lens. ■ Ideal for illumination using a light-guide lens	2
	VR1102W	Red		630	3.5	6.0	20		
	PR1102W	Red		700	0.8	1.5	10		
	AA1102W	Orange		605	5.0	9.0	20		
	AY1102W	Yellow		580	3.0	6.0	20		
	PY1102W	Yellow		570	6.0	12.0	20		
	PG1102W	Green		560	3.0	7.5	20		
	BG1102W	Pure Green		555	0.9	2.3	20		
	BRPY1201W	Red	Water Clear	660	1.6	4.5	20	■ Bi-color Type ■ Flat lens type ■ Wide distribution ■ Ideal for back illumination	3
		Yellow		570	1.4	4.0	20		
	BRPG1201W	Red		660	1.6	4.5	20		
		Green		560	1.2	3.0	20		
	BRBG1201W	Red		660	1.6	4.5	20		
		Pure Green		555	0.7	1.4	20		
	AAPY1201W	Orange		605	1.0	3.6	20		
		Yellow		570	1.4	4.0	20		
	BRPY1202W	Red	Water Clear	660	3.2	9.0	20	■ Bi-color type ■ Dome lens type ■ Ideal for illumination using a light-guide lens	4
		Yellow		570	2.8	8.0	20		
	BRPG1202W	Red		660	3.2	9.0	20		
		Green		560	2.4	6.0	20		
	BRBG1202W	Red		660	3.2	9.0	20		
		Pure Green		555	0.8	1.8	20		
	AAPY1202W	Orange		605	4.0	7.2	20		
		Yellow		570	2.8	8.0	20		
	BRPY1203W	Red	Water Clear	660	3.5	10.0	20	■ Bi-color type ■ Single lens type ■ Yellow or green has inner lens to unify the brightness with red which has flat lens	5
		Yellow		570	6.0	12.0	20		
	BRPG1203W	Red		660	3.5	10.0	20		
		Green		560	3.0	7.5	20		
	BRBG1203W	Red		660	3.5	10.0	20		
		Pure green		555	0.9	2.3	20		
	BRPY1204W	Red	Water Clear	660	6.0	17.0	20	■ Bi-Color Type ■ Both colors have inner lens respectively to achieve high intensity ■ Ideal for illumination using a light-guide lens	6
		Yellow		570	6.0	12.0	20		
	BRPG1204W	Red		660	6.0	17.0	20		
		Green		560	3.0	7.5	20		
	BRBG1204W	Red		660	6.0	17.0	20		
		Pure Green		555	0.9	2.3	20		
	AAPY1204W	Orange		605	5.0	9.0	20		
		Yellow		570	6.0	12.0	20		

● Dip soldering : Temperature should be 260°C or lower and the dip time within 5sec. or shorter.

● Reflow soldering : Pre-heat to 120°C or lower within 2 min. Heat to 240°C or lower within 5 sec.

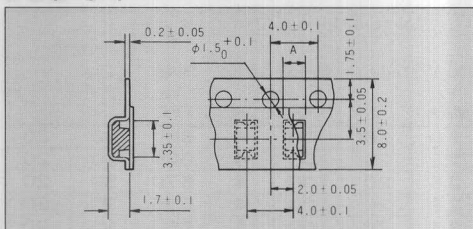
▼CHIP LED TAPING SPECIFICATIONS

■Orientation of polarity on taping



Standard Orientation of polarity:「-TR」

■Taping specifications Unit:mm



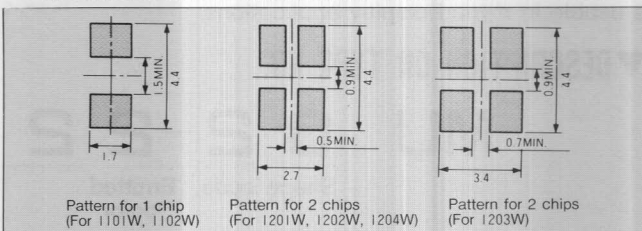
Ex. BR1102W-TR

A-dimension (Tolerance:±0.1)

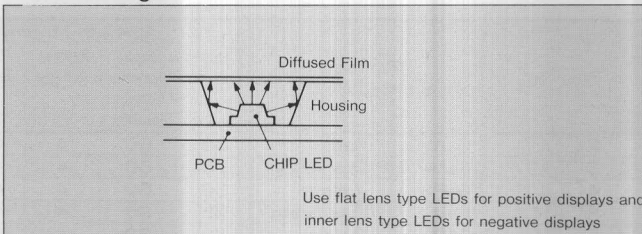
1 CHIP	1.8
2 CHIPS	2.8(2.3)*

※For 1203 type

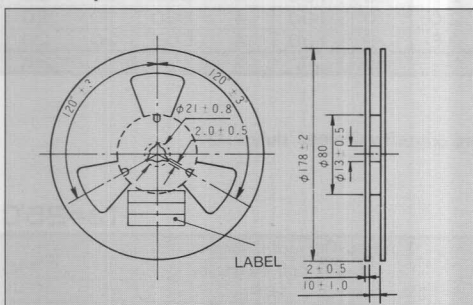
▼RECOMMENDED MOUNTING PATTERN Unit:mm



▼Housing mounting example to accommodate the package lens configuration.



■Reel specifications Unit:mm

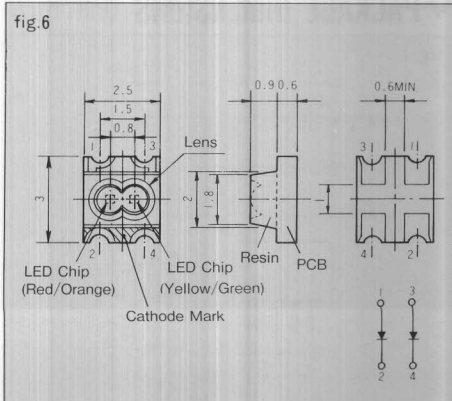
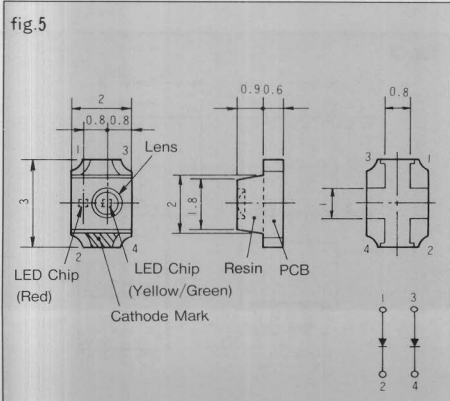
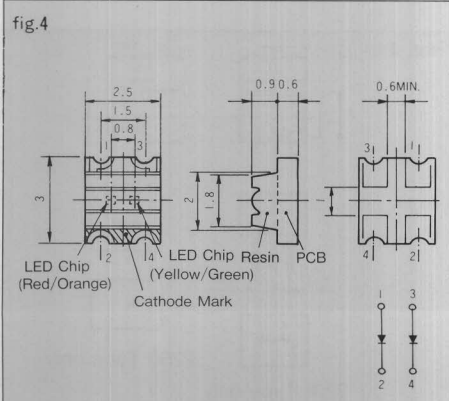
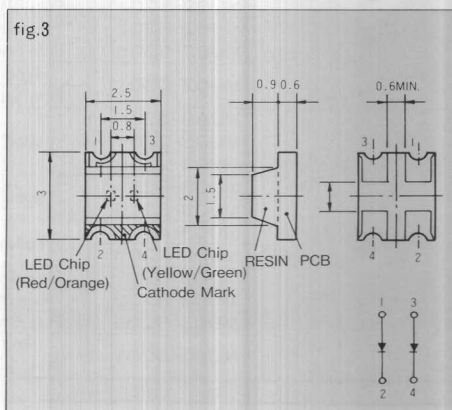
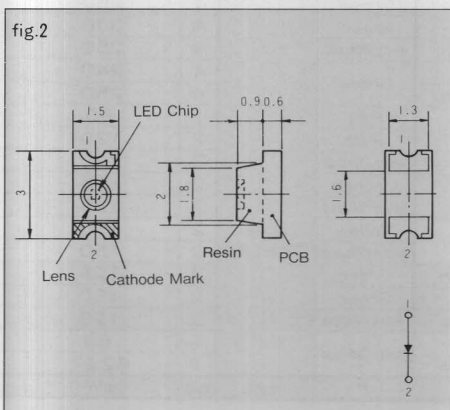
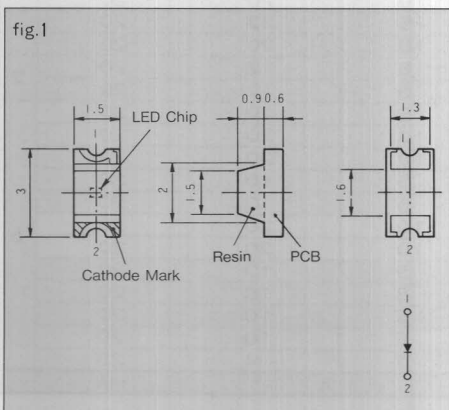


Quantity (Pcs)

1 CHIP	2,500
2 CHIPS	2,500

Specifications conform to EIAJ RC-1009A

▼PACKAGE DIMENSIONS Unit:mm



●Tolerance:±0.2mm

SUPER BRIGHT LED LIGHT BAR MODULE

Stanley's MU Series of super-bright LED light bar modules can be selected from a wide range of configurations and colors to suit a broad range of requirements. By using front mask patterns, including letter, numerals and even graphics, the series is usable in myriad display applications.

▼DESCRIPTION ON TYPE NO.

MU 02-2201

Shape code

Emitted color

Suffix

2.Red 3.Orange 4.Yellow 5.Green/Pure Green

▼CHARACTERISTICS BY COLOR

Ta=25°C

Type No.	Material Emitted Color	Absolute Maximum Ratings					Electro-Optical Characteristics						
		Forward Current	Peak Forward Current	Reverse Voltage	Operating Temperature	Storage Temperature	Forward Voltage		Reverse Current		Peak	Spectral Line Half Width, ΔλTYP.	Wavelength
		IF※1	IFM※2	VR	Topr※3	Tstg※4	TYP.	MAX.	IF	MAX.	VR	λp	
2□□□	GaAlAs (Red)	30	60	4	-40~+85	-40~+85	1.7	2.0	20	100	4	660	30
3□□□	GaAsP/GaP (Orange)	25	60	4	-40~+85	-40~+85	2.2	2.5	20	100	4	605	30
4□□□	GaP (Yellow)	30	60	4	-40~+85	-40~+85	2.1	2.5	20	100	4	570	30
5□□1	GaP (Pure Green)	25	60	4	-40~+85	-40~+85	2.2	2.5	20	100	4	555	30
5□□2	GaP (Green)	30	60	4	-40~+85	-40~+85	2.1	2.5	20	100	4	560	30
9□□1	GaAlAs (Red)	30	60	4	-40~+85	-40~+85	1.7	2.0	20	100	4	660	30
9□□2	GaP (Pure Green)	25	60	4	-40~+85	-40~+85	2.2	2.5	20	100	4	555	30
9□□2	GaAlAs (Red)	30	60	4	-40~+85	-40~+85	1.7	2.0	20	100	4	660	30
9□□2	GaP (Yellow)	30	60	4	-40~+85	-40~+85	2.1	2.5	20	100	4	570	30
9□□3	GaAlAs (Red)	30	60	4	-40~+85	-40~+85	1.7	2.0	20	100	4	660	30
9□□3	GaAsP/GaP (Orange)	25	60	4	-40~+85	-40~+85	2.2	2.5	20	100	4	605	30
Units		mA	mA	V	°C	°C	V	mA	μA	V	nm	nm	mA

※ 1: MU91, MU92 and MU93 Series are all 30mA.

※ 2: $tw \leq 2\text{msec}$, $duty \leq 1/5$.

However, for the MU91, MU92 and MU93 Series, 300mA for red and 100mA for yellow, orange and pure green ($tw \leq 1\text{msec}$, $duty \leq 1/20$).

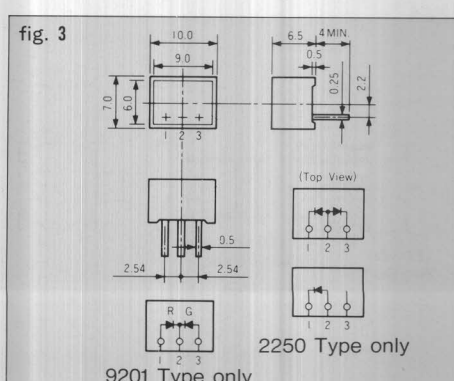
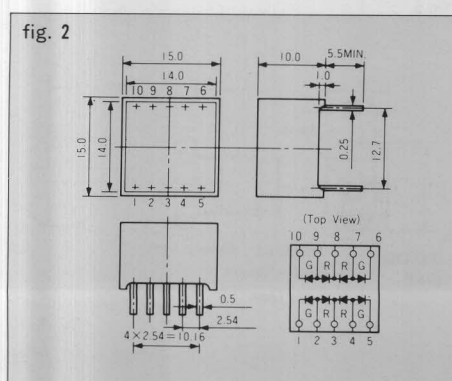
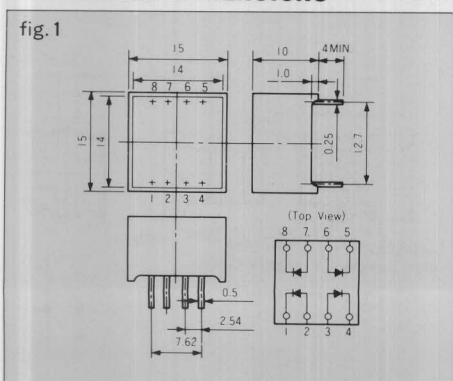
※ 3 ※ 4: For MU91, MU92 and MU93 Series, the temperature range is -30 to +85°C

▼CHARACTERISTICS BY SHAPE

Ta=25°C

Shape	Type No.	Emitted Color	Lens Color	Emitting Surface (Outer size)	Number of chips	Absolute Maximum Ratings	Electro-Optical Characteristics				Fig.
						Power Dissipation Pd	Luminous Intensity Iv				
							MIN.	TYP.	IF		
	MU02-2201	Red	Red	14×14 (15×15)	4	240	20	42	20	1	
	MU02-2205		White Diffused		4	240	20	42	20		
	MU02-3201	Orange	Orange		4	250	10	20	20		
	MU02-3205		White Diffused		4	250	10	20	20		
	MU02-4201	Yellow	Yellow		4	300	20	42	20		
	MU02-4205		White Diffused		4	300	20	42	20		
	MU02-5201	Pure Green	Green		4	250	10	20	20		
	MU02-5202	Green	Green		4	300	15	32	20		
	MU02-5205	Pure Green	White Diffused		4	250	10	20	20		
	MU02-9301	Red	Green		4	240	8	12	20		2
	Pure Green	4		250	8	12	20				
	MU03-2250	Red	Red	6×9 (7×10)	1	60	5	10	20	3	
	MU03-2201		Red		2	120	10	20	20		
	MU03-2205		White Diffused		2	120	10	20	20		
	MU03-3201	Orange	Orange		2	125	5	10	20		
	MU03-3205		White Diffused		2	125	5	10	20		
	MU03-4201	Yellow	Yellow		2	150	10	20	20		
	MU03-4205		White Diffused		2	150	10	20	20		
	MU03-5201	Pure Green	Green		2	125	5	10	20		
	MU03-5202	Green	Green		2	150	8	16	20		
	MU03-5205	Pure Green	White Diffused		2	125	5	10	20		
	MU03-9201	Red	White Diffused		1	60	5	10	20		
		Pure Green			1	62.5	3	4	20		
Unit				mm	pcs.	mW	mcd		mA		

▼PACKAGE DIMENSIONS Unit: mm

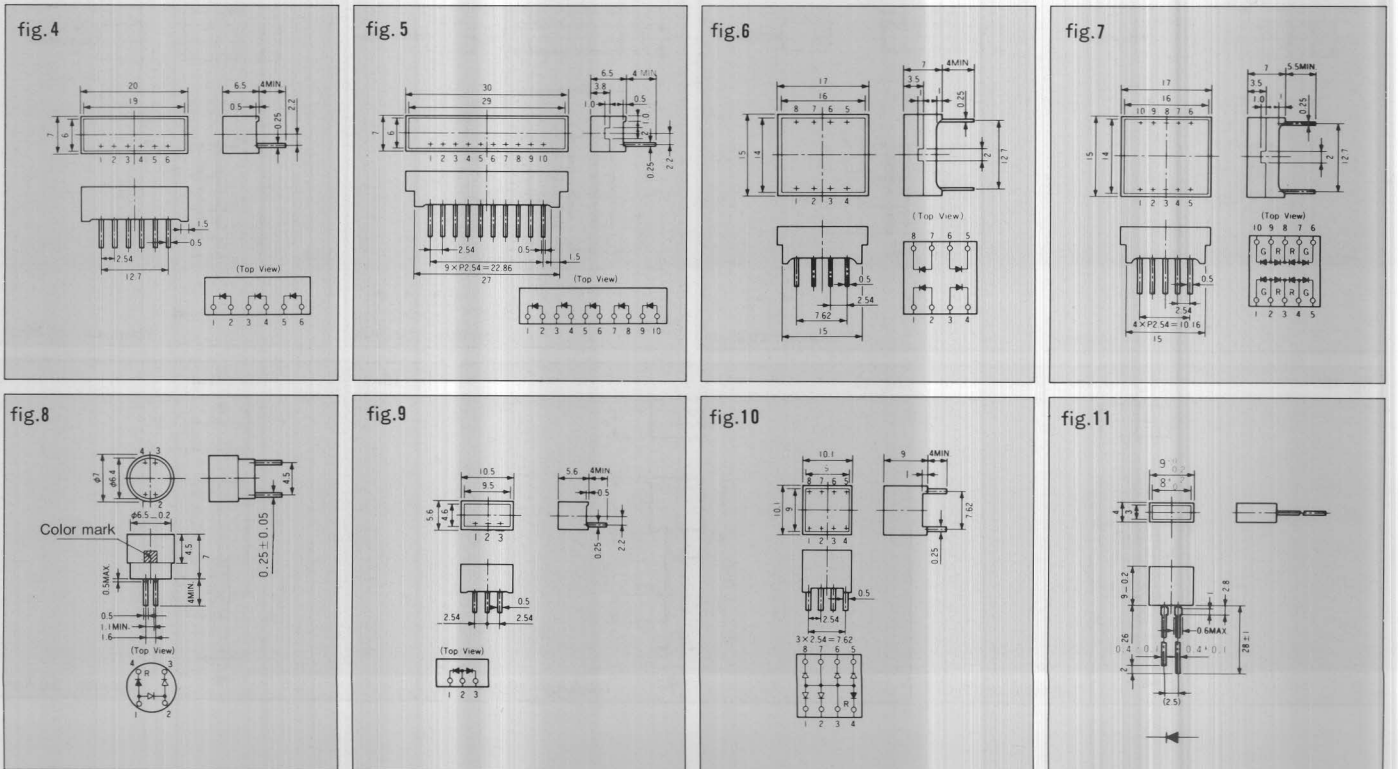


▼ CHARACTERISTICS BY SHAPE

Ta=25°C

Shape	Type No.	Emitted Color	Lens Color	Light Emitting Surface (Outer size)	Number of chips	Absolute Maximum Ratings Power Dissipation Pd	Electro-Optical Characteristics Luminous Intensity Iv			fig.
							MIN.	TYP.	IF	
	MU04-2101	Red	Red	6x19 (7x20)	3	180	15	32	20	4
	MU04-2105		White Diffused		3	180	15	32	20	
	MU04-3101	Orange	Orange		3	190	8	16	20	
	MU04-3105		White Diffused		3	190	8	16	20	
	MU04-4101	Yellow	Yellow		3	225	15	32	20	
	MU04-4105		White Diffused		3	225	15	32	20	
	MU04-5101	White Diffused	Green		3	190	8	16	20	
	MU04-5102	Green	Green		3	225	10	20	20	
	MU07-2101	Red	Red	6x29 (7x30)	5	300	20	40	20	5
	MU07-3101	Orange	Orange		5	320	10	20	20	
	MU07-4101	Yellow	Yellow		5	375	20	40	20	
	MU07-5101	Pure Green	Green		5	320	10	20	20	
	MU08-2201	Red	Red	14x16 (15x17)	4	240	20	40	20	6
	MU08-3201	Orange	Orange		4	250	10	20	20	
	MU08-4201	Yellow	Yellow		4	300	20	40	20	
	MU08-5201	Pure Green	Green		4	250	10	20	20	
	MU08-9301	Red	Green		4	240	8	12	20	
	MU08-9301	Pure Green	Green		4	250	8	12	20	7
	MU09-9101	Red	White Diffused	φ6.4 (φ7)	1	60	4	8	20	8
	MU09-9102	Red	White Diffused		2	125	4	6	20	
	MU09-9102	Yellow	White Diffused		1	60	4	8	20	
	MU09-9103	Red	White Diffused		2	150	6	12	20	
	MU09-9103	Orange	White Diffused		2	125	4	8	20	9
	MU11-2201	Red	Red	4.6x9.5 (5.6x10.5)	2	120	10	20	20	
	MU11-3201	Orange	Orange		2	125	5	10	20	
	MU11-4201	Yellow	Yellow		2	150	10	20	20	
	MU11-5201	Pure Green	Green		2	125	5	10	20	10
	MU13-9101	Red	White Diffused	9x9 (10.1x10.1)	1	60	6	12	20	
	MU13-9101	Pure Green	White Diffused		5	310	7	14	20	
	MU13-9102	Red	White Diffused		1	60	6	12	20	
	MU13-9102	Yellow	White Diffused		5	375	20	40	20	
	MU14-2101	Red	Red	3x8 (4x9)	1	60	4	8	20	11
	MU14-3101	Orange	Orange		1	62	3	6	20	
	MU14-4101	Yellow	Yellow		1	75	4	8	20	
	MU14-5101	Pure Green	Green		1	62	2	4	20	
Units				mm	pcs.	mW	mcd			

▼ PACKAGE DIMENSIONS Units:mm



Tolerance : ±0.25mm

SUPER BRIGHT LED LIGHT BAR MODULE

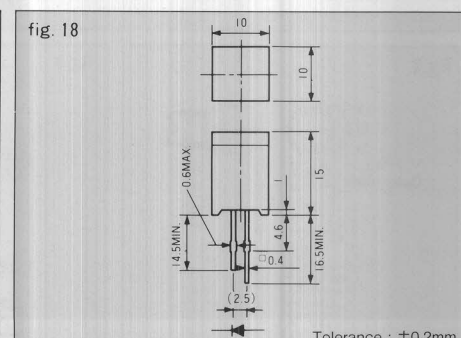
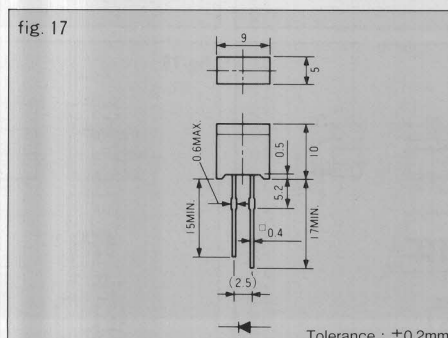
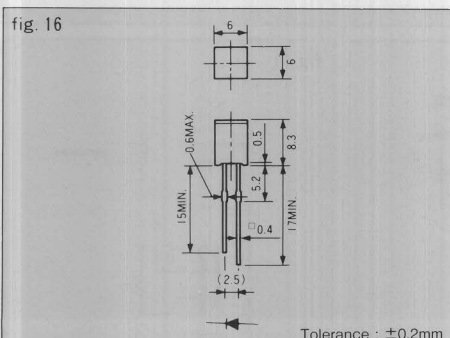
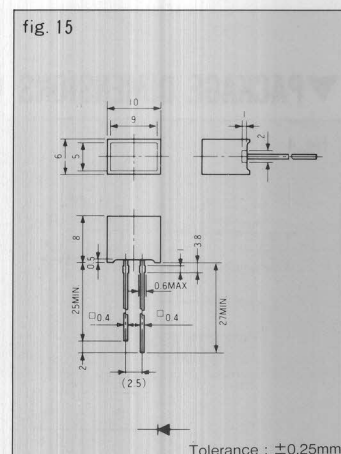
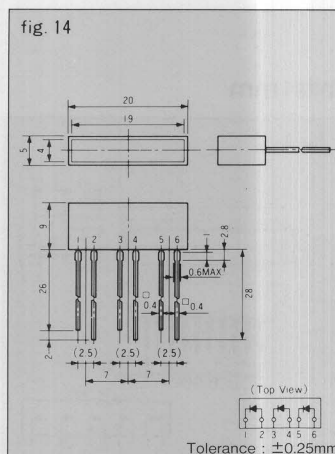
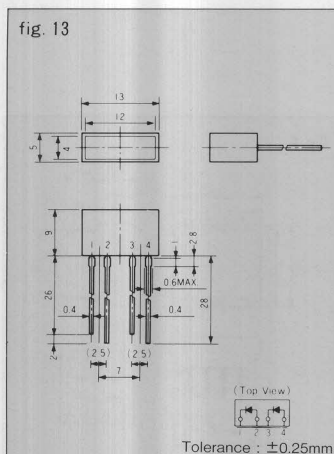
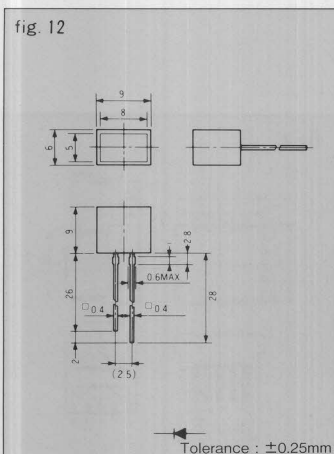
▼ CHARACTERISTICS BY SHAPE

Ta=25°C

Shape	Type No.	Emitted Color	Lens Color	Light Emitting Surface (Outer size)	Number of Chips	Absolute Max. Ratings	Electro-Optical Characteristics			fig.
						Power Dissipation	Luminous Intensity Iv			
						Pd	MIN.	TYP.	If	
	MU15-2101	Red	Red	5×8 (6×9)	1	60	4	8	20	12
	MU15-3101	Orange	Orange		1	62.5	3	6	20	
	MU15-4101	Yellow	Yellow		1	75	4	8	20	
	MU15-5101	Pure Green	Green		1	62.5	2	4	20	
	MU16-2101	Red	Red	4×12 (5×13)	2	120	8	16	20	13
	MU16-3101	Orange	Orange		2	125	6	12	20	
	MU16-4101	Yellow	Yellow		2	150	5	10	20	
	MU16-5101	Pure Green	Green		2	125	4	8	20	
	MU17-2101	Red	Red	4×19 (5×20)	3	180	12	24	20	14
	MU17-3101	Orange	Orange		3	190	9	18	20	
	MU17-4101	Yellow	Yellow		3	225	12	24	20	
	MU17-5101	Pure Green	Green		3	190	5	10	20	
	MU20-2101	Red	Red	5×9 (6×10)	1	60	4	8	20	15
	MU20-3101	Orange	Orange		1	62.5	3	6	20	
	MU20-4101	Yellow	Yellow		1	75	4	8	20	
	MU20-5101	Pure Green	Green		1	62	2	4	20	
	MU91-2001	Red	Red	6×6 (6×6)	1	60	3	6	20	16
	MU91-3001	Orange	Orange		1	75	3	6	20	
	MU91-4001	Yellow	Yellow		1	75	3	6	20	
	MU91-5001	Pure Green	Green		1	75	1.2	2.4	20	
	MU92-2001	Red	Red	9×5 (9×5)	1	60	3	6	20	17
	MU92-3001	Orange	Orange		1	75	3	6	20	
	MU92-4001	Yellow	Yellow		1	75	3	6	20	
	MU92-5001	Pure Green	Green		1	75	1.2	2.4	20	
	MU93-2001	Red	Red	10×10 (10×10)	1	60	4	8	20	18
	MU93-3001	Orange	Orange		1	75	4	8	20	
	MU93-4001	Yellow	Yellow		1	75	4	8	20	
	MU93-5001	Pure Green	Green		1	75	1.5	3	20	
Units				mm	pcs.	mW	mcd		mA	

White diffused lens is applicable to MU14~20. The last digit of type no. shall be -□□□5.

▼ DIMENSIONS Units : mm



SUPER BRIGHT LED LINE INDICATOR

● Stanley LEDs are supplied in red, orange, yellow and green. These four colors are printed to identify those LEDs.

Stanley super-bright LED line indicators are available in three types-2X10, 2X15 and 2X20 and enable selection of red, orange, yellow and green. The use of super-bright LEDs ensures a uniform-intensity line display.

▼ DESCRIPTION ON TYPE NO.

BR 0014

Emitted Color Shape Code Lens Color — 4.....White diffused 5.....Color diffused
 BR: Red AA: Orange PY: Yellow BG: Pure Green

▼ CHARACTERISTICS BY COLOR

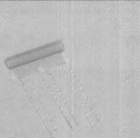
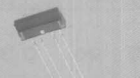
Ta=25°C

Type No.	Material (Emitted Color)	Absolute Maximum Ratings					Electro-Optical Characteristics								
		Forward Current	Peak Forward Current	Reverse Voltage	Operating Temperature	Storage Temperature	Forward Voltage			Reverse Current		Wavelength			
		IF1	IFM※	VR	Topr	Tstg	TYP.	MAX.	IF	MAX.	IR	VR	Peak λp TYP.	Spectral Line Half Width Δλ TYP.	IF
BR	GaAlAs (Red)	30	60	4	-20~+85	-40~+85	1.7	2.0	20	100	4	660	30	20	
AA	GaAsP/GaP (Orange)	25	60	4	-20~+85	-40~+85	2.2	2.5	20	100	4	605	30	20	
PY	GaP (Yellow)	30	60	4	-20~+85	-40~+85	2.1	2.5	20	100	4	570	30	20	
BG	GaP (Pure Green)	25	60	4	-20~+85	-40~+85	2.2	2.5	20	100	4	555	30	20	
Units		mA	mA	V	°C		V			mA	μA	V	nm		mA

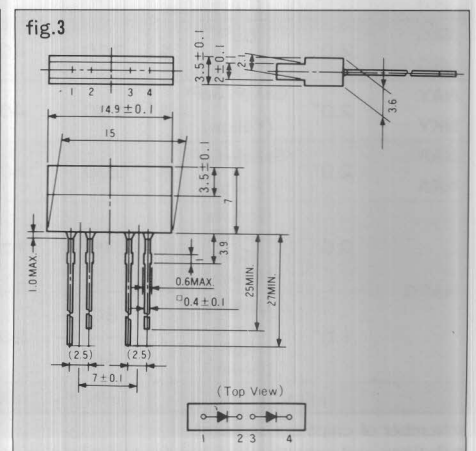
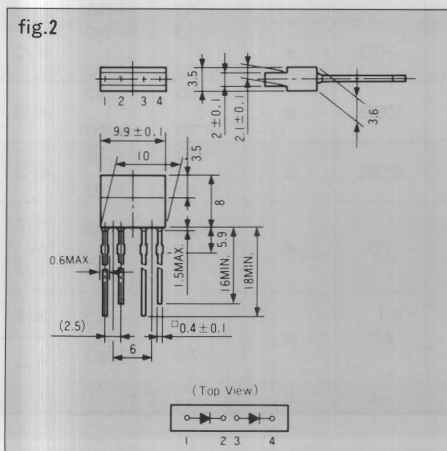
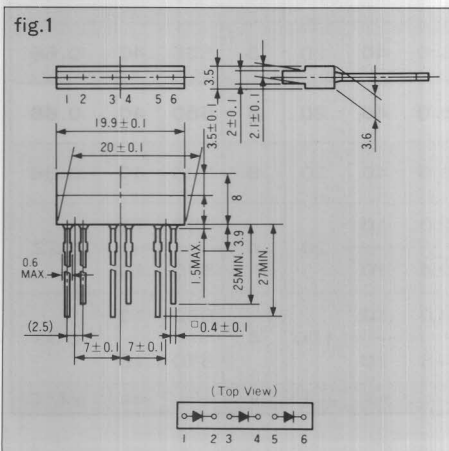
※Conditions: tw≤2msec, Duty≤1/5

▼ CHARACTERISTICS BY SHAPE

Ta=25°C

Shape	Type No.	Emitted Color	Lens Color	Emitting Surface (Outer size)	Number of chips	Absolute Maximum Ratings	Electro-Optical Characteristics			fig.
						Power Dissipation Pd	Luminous Intensity Iv			
							MIN.	TYP.	IF	
	BR0014	Red	White Diffused	2×19.9 (2×20)	3	180	8	16	20	1
	BR0015		Red		3	180	8	16	20	
	AA0014	Orange	White Diffused		3	190	5	10	20	
	AA0015		Orange		3	190	5	10	20	
	PY0014	Yellow	White Diffused		3	225	10	20	20	
	PY0015		Yellow		3	225	10	20	20	
	BG0014	Pure Green	White Diffused		3	190	4	6	20	
	BG0015		Green		3	190	4	6	20	
	BR0034	Red	White Diffused	2×9.9 (2×10)	2	120	5	10	20	2
	BR0035		Red		2	120	5	10	20	
	AA0034	Orange	White Diffused		2	125	3	6	20	
	AA0035		Orange		2	125	3	6	20	
	PY0034	Yellow	White Diffused		2	150	6	12	20	
	PY0035		Yellow		2	150	6	12	20	
	BG0034	Pure Green	White Diffused		2	125	2	4	20	
	BG0035		Green		2	125	2	4	20	
	BR0044	Red	White Diffused	2×14.9 (2×15)	2	120	5	10	20	3
	BR0045		Red		2	120	5	10	20	
	AA0044	Orange	White Diffused		2	125	3	6	20	
	AA0045		Orange		2	125	3	6	20	
	PY0044	Yellow	White Diffused		2	150	6	12	20	
	PY0045		Yellow		2	150	6	12	20	
	BG0044	Pure Green	White Diffused		2	125	2	4	20	
	BG0045		Green		2	125	2	4	20	
Units				mm	pcs.	mW	mcd		mA	

▼ DIMENSIONS Units: mm



● Tolerance: ±0.2mm

SUPER BRIGHT LED NUMERIC DISPLAY

Stanley numeric LED displays provide crisp, sharp numerals of high intensity and selection can be made for red, pure green, green, yellow and orange as the emitted light colors. Types with character height varying from 0.3 "to 2.0" are available, as both 7-segment and alphanumeric displays, enabling the product line to provide solutions to virtually any display problem. Low current drive is possible and these LEDs are ideal for dynamic drive.

▼DESCRIPTION ON TYPE NO.

N	A	R	1	4	1
Type	Common	Emitted Color	No. of	Character	Face
N:7 Segment	S:No	R:Red	Digit	Height	Color
	common	G:Pure Green	1:Single	3:0.3inch(7.5mm)	1,5:Black
	A:Anode	G-P:Green	2:Dual	4:0.4inch(10mm)	3,7:Gray
	K:Cathode	Y:Yellow		6:0.6inch(15mm)	
		A:Orange		0:1inch(25mm)	
		RG:Red, Green		2:2inch(50mm)	

▼CHARACTERISTICS BY COLOR

Ta=25°C

Type No.		Material (Emitted Color)	※	Absolute Maximum Ratings						Electro-Characteristics							Derating ΔIf
				Power Dissipa- tion Pd	Forward Current If	Peak Forward Current IFM	Reverse Voltage VR	Operation Temp. Topr	Storage Temp. Tstg	Forward Voltage VF			Reverse Current IR		Wavelength λp		
	Digit Height									TYP.	MAX.	If	MAX.	VR	TYP.	If	
NAR NKR	0.3"	Gap (Red)	1	37.5	15	60	4	-30 }+85	-30 }+85	2.0	2.5	10	100	4	700	10	0.25
NAG NKG	0.3"	GaP (Pure Green)	1	36	15	60	4	-30 }+85	-30 }+85	2.0	2.4	10	100	4	555	10	0.25
NAG-P NKG-P	0.3"	GaP (Green)	1	48	20	80	4	-30 }+85	-30 }+85	2.0	2.4	10	100	4	565	10	0.33
NAY NKY	0.3"	GaAsP/GaP (Yellow)	1	48	20	80	4	-30 }+85	-30 }+85	2.0	2.4	10	100	4	580	10	0.33
NAA NKA	0.3"	GaAsP/GaP (Orange)	1	48	20	80	4	-30 }+85	-30 }+85	2.0	2.4	10	100	4	605	10	0.33
NSR NAR NKR	0.4" 0.6" 1.0"	GaAlAs (Red)	1 2	60 120	30	120	4 8	-40~+85 -20~+85	-40~+85 -20~+85	1.7 3.4	2.0 4.0	20	100	4 8	660	20	0.41
NSG NAG NKG	0.4" 0.6" 1.0"	GaP (Pure Green)	1 2	63 126			4 8	-40~+85 -20~+85	-40~+85 -20~+85	2.2 4.4	2.5 5.0	20		4 8			
NSG-P NAG-P NKG-P	0.4" 0.6" 1.0"	GaP (Green)	1 2	63 126	25	100	4 8	-40~+85 -20~+85	-40~+85 -20~+85	2.2 4.4	2.5 5.0	20	100	4 8	565	20	0.34
NSY NAY NKY	0.4" 0.6" 1.0"	GaAsP/GaP (Yellow)	1 2	63 126			4 8	-40~+85 -20~+85	-40~+85 -20~+85	2.2 4.4	2.5 5.0	20		4 8			
NSA NAA NKA	0.4" 0.6" 1.0"	GaAsP/GaP (Orange)	1 2	63 126	25	100	4 8	-40~+85 -20~+85	-40~+85 -20~+85	2.2 4.4	2.5 5.0	20	100	4 8	605	20	0.34
NAR NKR	2.0"	GaAlAs (Red)	4	200			40	200	8	-30 }+70	-30 }+80	3.4		4.0			
NAG NKG	2.0"	GaP (Pure Green)	4	200	40	200	8	-30 }+70	-30 }+80	4.2	5.0	40	20	8	555	40	0.66
NAY NKY	2.0"	GaAsP/GaP (Yellow)	4	200	40	200	8	-30 }+70	-30 }+80	4.2	5.0	40	20	8	580	40	0.66
NAA NKA	2.0"	GaAsP/GaP (Orange)	4	200	40	200	8	-30 }+70	-30 }+80	4.2	5.0	40	20	8	605	40	0.66
NARG	0.6"	GaAlAs (Red) GaP (Green)	1	36	15	70	4	-30 }+70	-30 }+80	1.7 1.2	2.0 2.4	10	20	4	660 570	10 10	0.22
			2	80 96	20	※1 40	4	-30 }+70	-30 }+80	3.4 4.0	4.0 4.8	10		4	660 570	10 10	
	Units			mW			mA	mA	V	°C	V	mA	μA	V	nm	mA	mA/°C

※Number of chips per segment

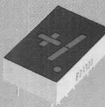
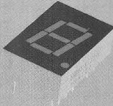
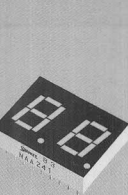
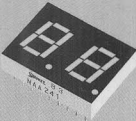
●Ratings and specifications are for one segment.

●When both colors of a bi-color LED are driven simultaneously, the rating of NARG types are the total of the Pd, If and IFM values.

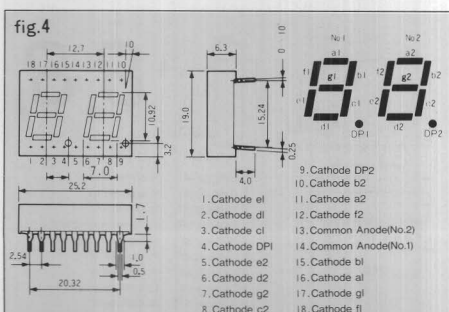
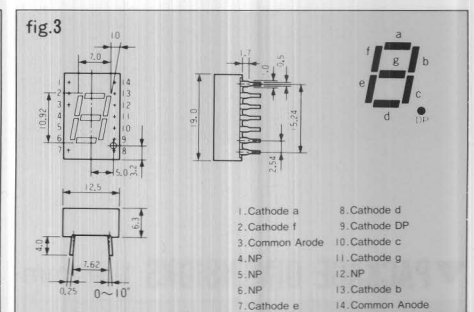
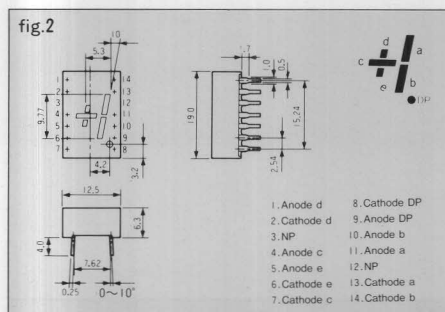
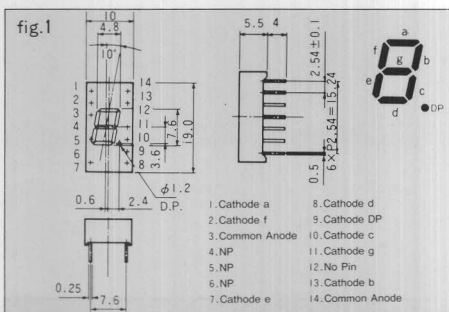
※1: NARG 1.0" type in dynamic drive has a duty cycle 1/2, f=500Hz and the others have a duty cycle 1/5, f=1kHz

▼0.3/0.4 inch type

Ta=25°C

Digit Height	Shape	Type No.		Common	Emitted Color	Luminous Intensity								fig.
		Black Face	Gray Face			I _v				I _F				
						Rank A		Rank B			Rank C			
						MIN.	TYP.	MIN.	TYP.	MIN.	TYP.			
0.3" 7.5mm		NAR131	NAR133	Anode	Red	0.15	0.3	0.3	0.6	—	—	10	1	
		NAG131	NAG133		Pure Green	0.1	0.2	0.2	0.4	—	—	10		
		NAG131P	NAG133P		Green	0.3	0.6	0.6	1.2	—	—	10		
		NAY131	NAY133		Yellow	0.2	0.4	0.4	0.8	—	—	10		
		NAA131	NAA133		Orange	0.4	0.8	0.8	1.6	—	—	10		
		NKR131	NKR133	Cathode	Red	0.15	0.3	0.3	0.6	—	—	10		
		NKG131	NKG133		Pure Green	0.1	0.2	0.2	0.4	—	—	10		
		NKG131P	NKG133P		Green	0.3	0.6	0.6	1.2	—	—	10		
		NKY131	NKY133		Yellow	0.2	0.4	0.4	0.8	—	—	10		
		NKA131	NKA133		Orange	0.4	0.8	0.8	1.6	—	—	10		
0.4" 10mm		NSR141	NSR143	—	Red	2	4	4	8	8	11	20	2	
		NSG141	NSG143		Pure Green	0.5	1	1	2	—	—	20		
		NSG141P	NSG143P		Green	0.5	1	1	2	—	—	20		
		NSY141	NSY143		Yellow	1.5	3	3	6	—	—	20		
		NSA141	NSA143		Orange	1.5	3	3	6	—	—	20		
		NAR141	NAR143	Anode	Red	2	4	4	8	8	11	20	3	
		NAG141	NAG143		Pure Green	0.5	1	1	2	—	—	20		
		NAG141P	NAG143P		Green	0.5	1	1	2	—	—	20		
		NAY141	NAY143		Yellow	1.5	3	3	6	—	—	20		
		NAA141	NAA143		Orange	1.5	3	3	6	—	—	20		
		NKR141	NKR143	Cathode	Red	2	4	4	8	8	11	20	4	
		NKG141	NKG143		Pure Green	0.5	1	1	2	—	—	20		
		NKG141P	NKG143P		Green	0.5	1	1	2	—	—	20		
		NKY141	NKY143		Yellow	1.5	3	3	6	—	—	20		
		NKA141	NKA143		Orange	1.5	3	3	6	—	—	20		
		NAR241	NAR243	Anode	Red	2	4	4	8	8	11	20	4	
		NAG241	NAG243		Pure Green	0.5	1	1	2	—	—	20		
		NAG241P	NAG243P		Green	0.5	1	1	2	—	—	20		
		NAY241	NAY243		Yellow	1.5	3	3	6	—	—	20		
		NAA241	NAA243		Orange	1.5	3	3	6	—	—	20		
		NKR241	NKR243	Cathode	Red	2	4	4	8	8	11	20		
		NKG241	NKG243		Pure Green	0.5	1	1	2	—	—	20		
		NKG241P	NKG243P		Green	0.5	1	1	2	—	—	20		
		NKY241	NKY243		Yellow	1.5	3	3	6	—	—	20		
		NKA241	NKA243		Orange	1.5	3	3	6	—	—	20		
Units						mcd						mA		

▼ PACKAGE DIMENSIONS Unit:mm

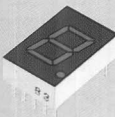
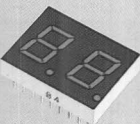


● Common cathode types have the reversed polarity (fig1,3,4) ● Tolerance:±0.25mm

SUPER BRIGHT LED NUMERIC DISPLAY

▼0.4 inch type

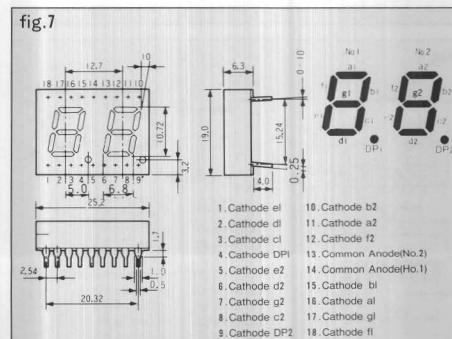
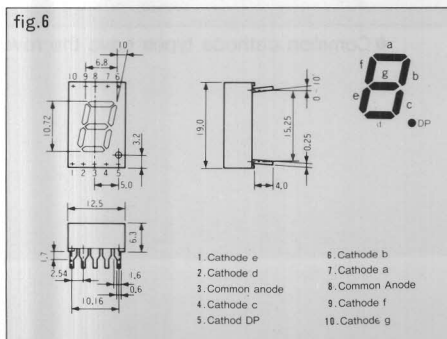
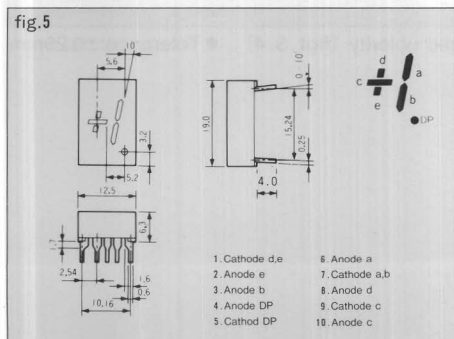
Ta=25°C

Digit Height	Shape	Type No.		Common	Emitted Color	Luminous Intensity I _v							fig.
		Black Face	Gray Face			Rank A		Rank B		Rank C		I _F	
						MIN.	TYP.	MIN.	TYP.	MIN.	TYP.		
0.4" 10mm		NSR145	NSR147	—	Red	1.6	3.2	3.2	6.4	6.4	8.8	20	5
		NSG145	NSG147		Pure Green	0.4	0.8	0.8	1.6	—	—	20	
		NSG145P	NSG147P		Green	0.4	0.8	0.8	1.6	—	—	20	
		NSY145	NSY147		Yellow	1.2	2.4	2.4	4.8	—	—	20	
		NSA145	NSA147		Orange	1.2	2.4	2.4	4.8	—	—	20	
		NAR145	NAR147	Anode	Red	1.6	3.2	3.2	6.4	6.4	8.8	20	6
		NAG145	NAG147		Pure Green	0.4	0.8	0.8	1.6	—	—	20	
		NAG145P	NAG147P		Green	0.4	0.8	0.8	1.6	—	—	20	
		NAY145	NAY147		Yellow	1.2	2.4	2.4	4.8	—	—	20	
		NAA145	NAA147		Orange	1.2	2.4	2.4	4.8	—	—	20	
		NKR145	NKR147	Cathode	Red	1.6	3.2	3.2	6.4	6.4	8.8	20	
		NKG145	NKG147		Pure Green	0.4	0.8	0.8	1.6	—	—	20	
		NKG145P	NKG147P		Green	0.4	0.8	0.8	1.6	—	—	20	
		NKY145	NKY147		Yellow	1.2	2.4	2.4	4.8	—	—	20	
		NKA145	NKA147		Orange	1.2	2.4	2.4	4.8	—	—	20	
		NAR245F	NAR247F	Anode	Red	1.6	3.2	3.2	6.4	6.4	8.8	20	7
		NAG245F	NAG247F		Pure Green	0.4	0.8	0.8	1.6	—	—	20	
		NAG245FP	NAG247FP		Green	0.4	0.8	0.8	1.6	—	—	20	
		NAY245F	NAY247F		Yellow	1.2	2.4	2.4	4.8	—	—	20	
		NAA245F	NAA247F		Orange	1.2	2.4	2.4	4.8	—	—	20	
		NKR245F	NKR247F	Cathode	Red	1.6	3.2	3.2	6.4	6.4	8.8	20	
		NKG245F	NKG247F		Pure Green	0.4	0.8	0.8	1.6	—	—	20	
		NKG245FP	NKG247FP		Green	0.4	0.8	0.8	1.6	—	—	20	
		NKY245F	NKY247F		Yellow	1.2	2.4	2.4	4.8	—	—	20	
		NKA245F	NKA247F		Orange	1.2	2.4	2.4	4.8	—	—	20	

Units						mcd						mA
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The 245F and 247F types have the same lead end width dimension of 0.5 mm as the 241 and 243 types.
(245 and 247 types with 0.6mm lead ends shall be replaced by 245F and 247F with 0.5mm lead ends)

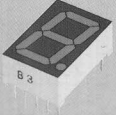
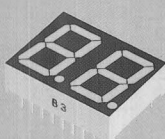
▼PACKAGE DIMENSIONS Unit:mm



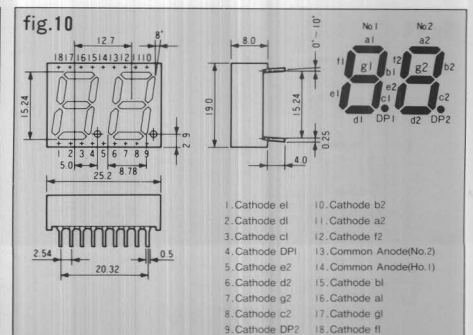
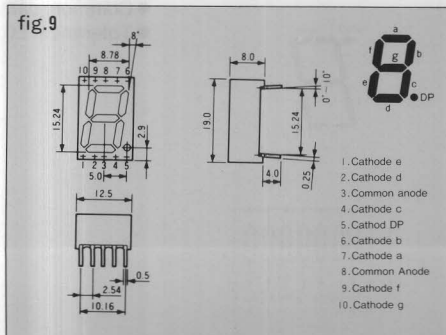
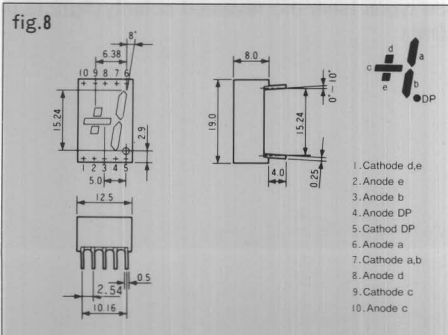
●Common cathode types have the reversed polarity (fig6,7). ●Tolerance:±0.25mm

▼0.6 inch type

Ta=25°C

Digit Height	Shape	Type No.		Common	Emitted Color	Luminous Intensity Iv								fig.
		Black Face	Gray Face			Rank A		Rank B		Rank C		If		
						MIN.	TYP.	MIN.	TYP.	MIN.	TYP.			
0.6" 15mm		NSR161	NSR163	—	Red	3	6	6	12	12	15	20	8	
		NSG161	NSG163		Pure Green	1	2	2	4	—	—	20		
		NSG161P	NSG163P		Green	1	2	2	4	—	—	20		
		NSY161	NSY163		Yellow	2	4	4	8	—	—	20		
		NSA161	NSA163		Orange	2	4	4	8	—	—	20		
		NAR161	NAR163	Anode	Red	3	6	6	12	12	15	20	9	
		NAG161	NAG163		Pure Green	1	2	2	4	—	—	20		
		NAG161P	NAG163P		Green	1	2	2	4	—	—	20		
		NAY161	NAY163		Yellow	2	4	4	8	—	—	20		
		NAA161	NAA163		Orange	2	4	4	8	—	—	20		
		NKR161	NKR163	Cathode	Red	3	6	6	12	12	15	20		
		NKG161	NKG163		Pure Green	1	2	2	4	—	—	20		
		NKG161P	NKG163P		Green	1	2	2	4	—	—	20		
		NKY161	NKY163		Yellow	2	4	4	8	—	—	20		
		NKA161	NKA163		Orange	2	4	4	8	—	—	20		
		NAR261	NAR263	Anode	Red	3	6	6	12	12	15	20	10	
		NAG261	NAG263		Pure Green	1	2	2	4	—	—	20		
		NAG261P	NAG263P		Green	1	2	2	4	—	—	20		
		NAY261	NAY263		Yellow	2	4	4	8	—	—	20		
		NAA261	NAA263		Orange	2	4	4	8	—	—	20		
		NKR261	NKR263	Cathode	Red	3	6	6	12	12	15	20		
		NKG261	NKG263		Pure Green	1	2	2	4	—	—	20		
		NKG261P	NKG263P		Green	1	2	2	4	—	—	20		
		NKY261	NKY263		Yellow	2	4	4	8	—	—	20		
		NKA261	NKA263		Orange	2	4	4	8	—	—	20		
Units						mcd						mA		

▼PACKAGE DIMENSIONS Unit:mm

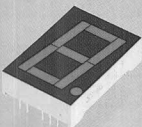
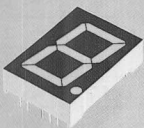
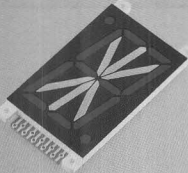


●Common cathode types have the reversed polarity(fig9,10) ●Tolerance±0.25mm

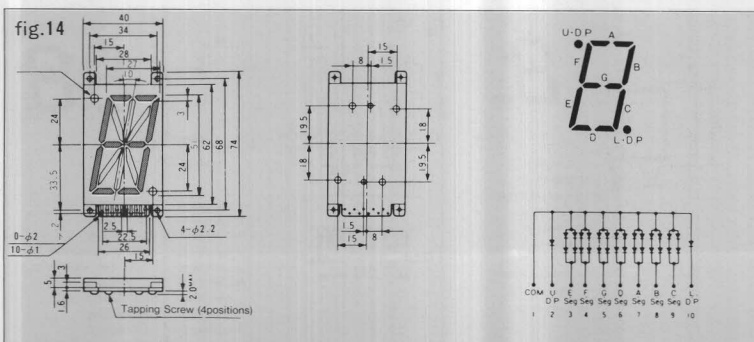
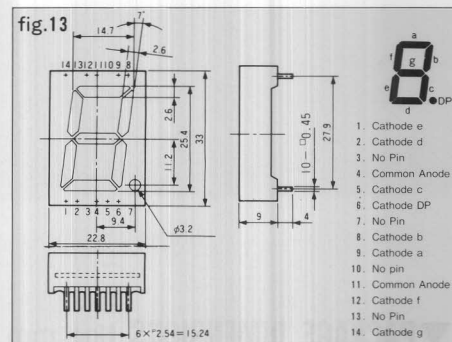
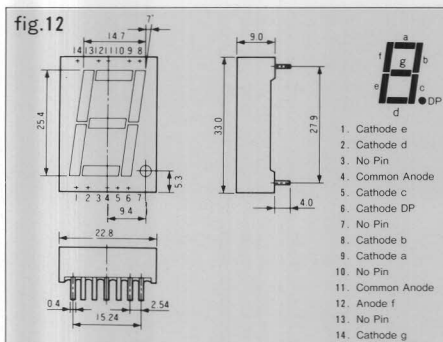
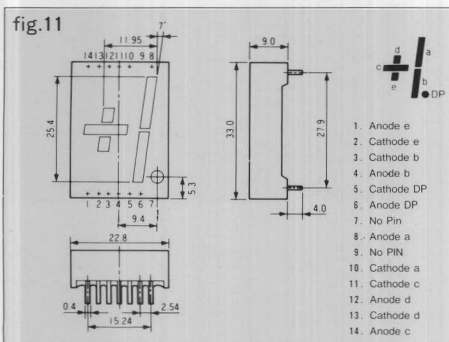
SUPER BRIGHT LED NUMERIC DISPLAY

▼1.0/2.0 inch type

 $T_a = 25^\circ\text{C}$

Digit Height	Shape	Type No.		Common	Emitted Color	Luminous Intensity							fig.		
		Black Face	Gray Face			Rank A		Rank B		Rank C		I _F			
						MIN.	TYP.	MIN.	TYP.	MIN.	TYP.				
1.0" 25mm		NSR101	NSR103	—	Red	5	10	10	20	20	25	20	1		
		NSG101	NSG103		Pure Green	2	4	4	8	—	—	20			
		NSG101P	NSG103P		Green	2	4	4	8	—	—	20			
		NSY101	NSY103		Yellow	3	6	6	12	—	—	20			
		NSA101	NSA103		Orange	4	8	8	16	—	—	20			
		NAR101	NAR103		Red	5	10	10	20	20	25	20			
		NAG101	NAG103	Anode	Pure Green	2	4	4	8	—	—	20	12		
		NAG101P	NAG103P		Green	2	4	4	8	—	—	20			
		NAY101	NAY103		Yellow	3	6	6	12	—	—	20			
		NAA101	NAA103		Orange	4	8	8	16	—	—	20			
		NKR101	NKR103		Red	5	10	10	20	20	25	20			
		NKG101	NKG103		Pure Green	2	4	4	8	—	—	20			
		NKG101P	NKG103P	Cathode	Green	2	4	4	8	—	—	20	13		
		NKY101	NKY103		Yellow	3	6	6	12	—	—	20			
		NKA101	NKA103		Orange	4	8	8	16	—	—	20			
		NAR105	NAR107		Red	5	10	10	20	20	25	20			
		NAG105	NAG107	Anode	Pure Green	2	4	4	8	—	—	20		13	
		NAG105P	NAG107P		Green	2	4	4	8	—	—	20			
		NAY105	NAY107		Yellow	3	6	6	12	—	—	20			
		NAA105	NAA107		Orange	4	8	8	16	—	—	20			
			NKR105	NKR107	Cathode	Red	5	10	10	20	20	25		20	14
			NKG105	NKG107		Pure Green	2	4	4	8	—	—		20	
			NKG105P	NKG107P		Green	2	4	4	8	—	—		20	
			NKY105	NKY107		Yellow	3	6	6	12	—	—		20	
NKA105	NKA107		Orange	4	8	8	16	—	—	20					
	NAR121		—	Anode	Red	—	—	4	6	—	—	40	14		
	NAG121		—		Pure Green	—	—	1	1.5	—	—	40			
	NAY121		—		Yellow	—	—	2	3	—	—	40			
	NAA121	—	Orange		—	—	2	3	—	—	40				
	NKR121	—	Cathode	Red	—	—	4	6	—	—	40	14			
	NKG121	—		Pure Green	—	—	1	1.5	—	—	40				
	NKY121	—		Yellow	—	—	2	3	—	—	40				
	NKA121	—		Orange	—	—	2	3	—	—	40				
Units					mcd							mA			

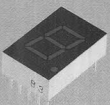
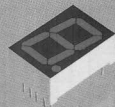
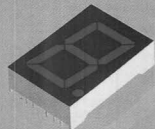
▼ **PACKAGE DIMENSIONS** Unit: mm



- Common cathode types have the reversed polarity (fig12,13,14)
- Tolerance: $\pm 0.25\text{mm}$

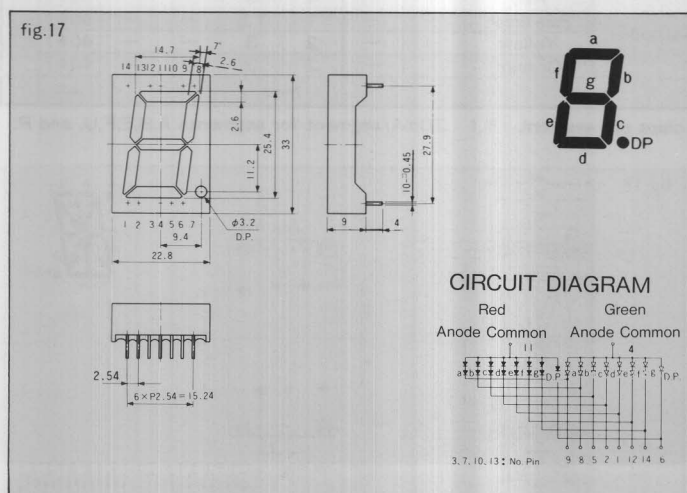
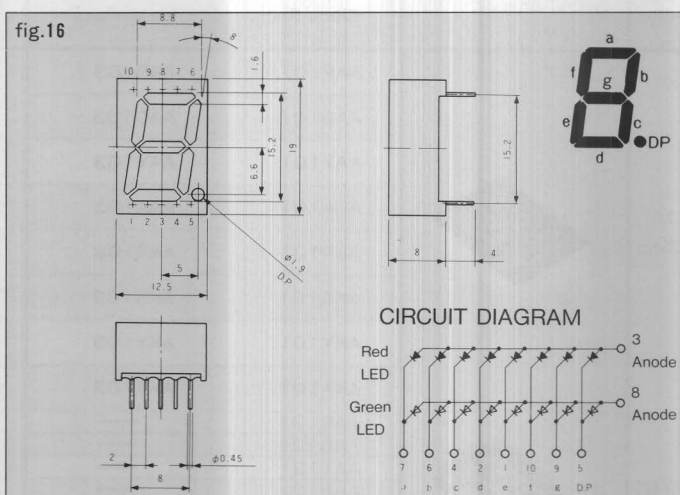
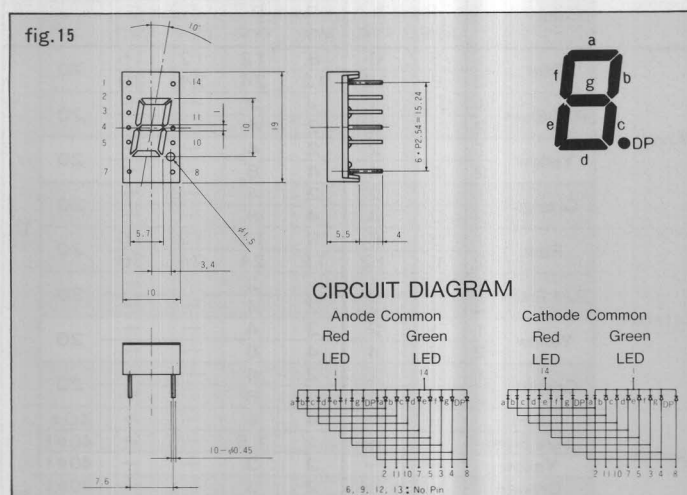
▼Bi-color LEDs for numeric displays 0.4/0.6/1.0 inch type

 $T_a = 25^\circ\text{C}$

Digit Height	Shape	Type No.		Common	Emitted Color	Luminous Intensity I _v			fig.
		Black Face	Gray Face			MIN.	TYP.	I _F	
0.4" 10mm		NARG145	NARG147	Anode	Red	1	2	10	15
					Green	1	2	10	
		NKRG145	NKRG147	Cathode	Red	1	2	10	
					Green	1	2	10	
0.6" 15mm		NARG161	NARG163	Anode	Red	1.2	2.4	10	16
					Green	1.2	2.4	10	
1.0" 25mm		NARG105	NARG107	Anode	Red	2	4	10	17
					Green	2	4	10	
Units						mcd	mA		

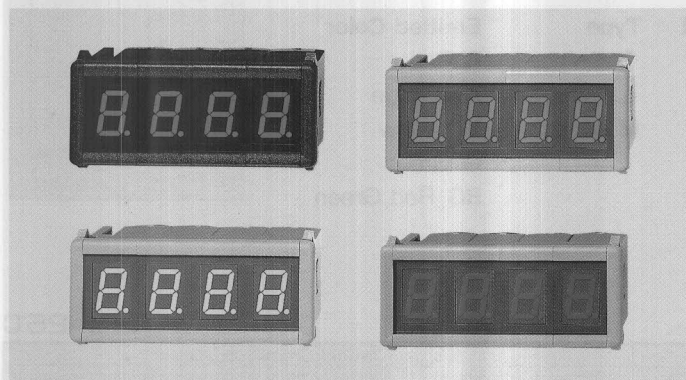
● Tolerance: $\pm 0.25\text{mm}$

▼ PACKAGE DIMENSIONS Unit: mm



LED DISPLAY MODULE

Stanley LED display modules provide high efficiency and high intensity, using 0.6inch (15mm) numeric characters. They are available in red, orange, yellow and green and provide attractive displays that are easily readable even in brightly lighted environments. Multi-digit displays can be easily configured since the units have linked structures. The BU406D and BU4400D types have built-in decoder and driver functions and the BU4400L also features a latch function which enables direct drive from a BCD unit.

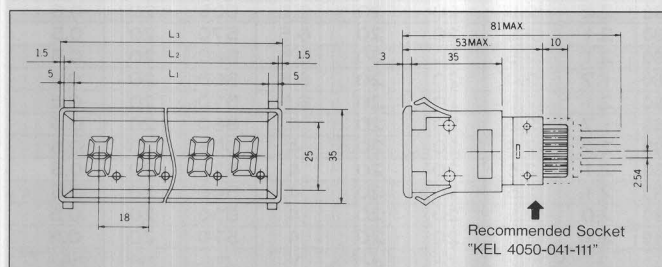


DESCRIPTION ON TYPE NO.

BU406D-R 01

Unit part number	Emitted Color	No. of Digit
BU406D	R : Red	01 : Single
BU4400D	G : Green	02 : Dual
BU4400L	Y : Yellow	10 : digits
	A : Orange	

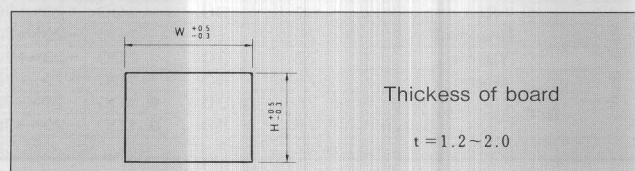
OUTER DIMENSIONS Unit: mm



MULTI-DIGIT LINKED DIMENSIONS (mm)

No. of Digit	L1	L2	L3	W	H
N	18XN	L1+7	L2+3	L2+1	31

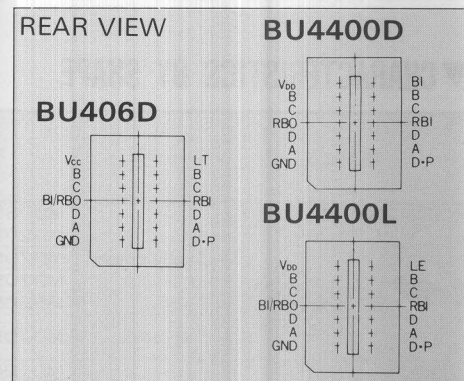
MULTI-DIGIT HOLE DIMENSIONS (mm)



ASSEMBLY SPECIFICATIONS

Item	symbol	BU406D	BU4400D	BU4400L
Functions	—	Decodr/driver	Decodr/driver	Decoder/driver/latch
IC	—	TTL SN74LS47 Equiv	C-MOS TC5022 Equiv	C-MOS MSM561RS Equiv
Supply voltage	Vcc/Vdd	DC4.75V~5.25V	DC4.75V~5.25V	DC4.75V~5.25V
Maximum power dissipation	PdMAX.	R:155mW Other:755mW	R:120mW Other:720mW	R:125mW Other:725mW
High-level input voltage	VIH	MIN. 2V	MIN. 3.6V	MIN. 3.6V
Low-level input voltage	UIL	MAX.0.8V	MAX.1.5V	MAX.0.8V
Current/segment	IF	R:3mA(TYP.) Other:18mA(TYP.)	R:3mA(TYP.) Other:18mA(TYP.)	R:3mA(TYP.) Other:18mA(TYP.)
No-load current	IDD	7mA(TYP.)	0.01μA(TYP.)	1mA(TYP.)
Operating temp.	Topr	0°C~+50°C	0°C~+50°C	0°C~+50°C
Storage temp.	Tstg	-30°C~+85°C	-30°C~+85°C	-30°C~+85°C

PIN ARRANGEMENT



FUNCTION TABLES

BU406D

DECIMAL OR FUNCTION	LT	RBI	D	C	B	A	BI/RBO	DISPLAY
0	H	H	L	L	L	L	H	0
1	H	X	L	L	L	H	H	1
2	H	X	L	L	H	L	H	2
3	H	X	L	L	H	H	H	3
4	H	X	L	H	L	L	H	4
5	H	X	L	H	L	H	H	5
6	H	X	L	H	H	L	H	6
7	H	X	L	H	H	H	H	7
8	H	X	H	L	L	L	H	8
9	H	X	H	L	L	H	H	9
BI	X	X	X	X	X	X	L	BLANK
RBI	H	L	L	L	L	L	L	BLANK
LT	L	X	X	X	X	X	H	8

BU4400D

DECIMAL OR FUNCTION	BI	RBI	D	C	B	A	BRO	DISPLAY
0	L	L	L	L	L	L	L	0
1	L	X	L	L	L	H	L	1
2	L	X	L	L	H	L	L	2
3	L	X	L	L	H	H	L	3
4	L	X	L	H	L	L	L	4
5	L	X	L	H	L	H	L	5
6	L	X	L	H	H	L	L	6
7	L	X	L	H	H	H	L	7
8	L	X	H	L	L	L	L	8
9	L	X	H	L	L	H	L	9
BI	H	X	X	X	X	X	X	BLANK
RBI	L	H	L	L	L	L	H	BLANK

BU4400L

DECIMAL OR FUNCTION	LE	RBI	D	C	B	A	BI/RBO	DISPLAY
0	H	H	L	L	L	L	H	0
1	H	X	L	L	L	H	H	1
2	H	X	L	L	H	L	H	2
3	H	X	L	L	H	H	H	3
4	H	X	L	H	L	L	H	4
5	H	X	L	H	L	H	H	5
6	H	X	L	H	H	L	H	6
7	H	X	L	H	H	H	H	7
8	H	X	H	L	L	L	H	8
9	H	X	H	L	L	H	H	9
BI	X	X	X	X	X	X	L	BLANK
RBI	H	L	L	L	L	L	L	BLANK
LATCH	L	H	X	X	X	X	—	LATCH

X: Either H or L is possible.

LED DOT MATRIX DISPLAY

The MD Series of stanley dot-matrix displays can handle virtually any display applications, including numerals, letters, special characters and graphics.

Versions are available with 5×7, 8×8 and 16×16 dot configurations in single color and bi-color types.

▼ DESCRIPTION ON TYPE NO.

MD 12 08 C - R

Outer Dimensions

06: 0.6inch (20mm)
12: 1.2inch (32mm)
20: 2.0inch (53mm)
25: 2.5inch (64mm)
37: 3.7inch (96mm)

No. of Dot

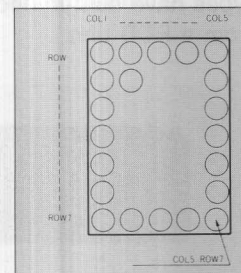
57: 5×7
08: 8×8
16: 16×16

Type

C: Chip
L: Lamp
M: Mold

Emitted Color

R: Red
A: Orange
Y: Yellow
G: Green
RG: Red Green



▼ CHARACTERISTICS BY COLOR (EACH CHIP)

Ta=25°C

Emitted Color		Absolute Maximum Ratings					Electro-Optical Characteristics							
		Power Dissipation Pd	Forward Current IF	Peak Forward Current *1IFM	Operating Temp Topr	Storage Temp Tstg	Forward Voltage VF			Reverse Current IR		Peak Wavelength λp		Derating ΔIFM
Chip type	Red (MD0657M-R)	30	—	60	-20~+70	-20~+85	1.7	2.0	10	100	4	660	10	0.89
	Red	22	—	70	-20~+70	-30~+80	1.7	2.0	20	20	6.5	660	20	0.5
	Orange	22	—	70	-20~+70	-30~+80	2.2	2.5	20	20	6.5	605	20	0.5
	Yellow	22	—	70	-20~+70	-30~+80	2.1	2.5	20	20	6.5	570	20	0.5
	Green	22	—	70	-20~+70	-30~+80	2.1	2.5	20	20	6.5	560	20	0.5
Mold type	Bi-Color Red	*22	—	*270	-20~+70	-30~+80	1.7	2.0	20	20	6.5	660	20	0.5
	Green	*22	—	*270	-20~+70	-30~+80	2.1	2.5	20	20	6.5	570	20	0.5
Lamp type	Red	60	30	100	-20~+70	-30~+80	1.7	2.0	20	20	4	660	20	0.5
	Orange	75	30	100	-20~+70	-30~+80	2.2	2.5	20	20	4	605	20	0.5
	Yellow	75	30	100	-20~+70	-30~+80	2.1	2.5	20	20	4	570	20	0.5
Bi-Color	Red	*275	*230	*2100	-20~+70	-30~+80	2.0	2.5	20	20	4	630	20	0.5
	Green	*275	*230	*2100	-20~+70	-30~+80	2.1	2.5	20	20	4	570	20	0.5
Units		mW	mA	mA	°C		V	mA	μA	V	nm	mA	mA/°C	

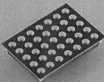
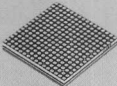
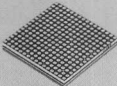
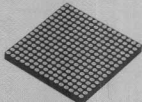
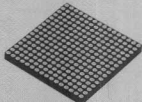
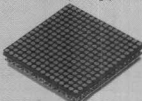
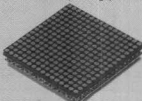
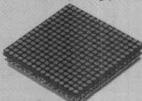
*1: IFM values apply under the conditions $t_w \leq 1\text{msec}$ and $duty \leq 1/16$

*2: Items marked *2 are for single-color drive. For two driven colors, total values are to be within specified ratings.

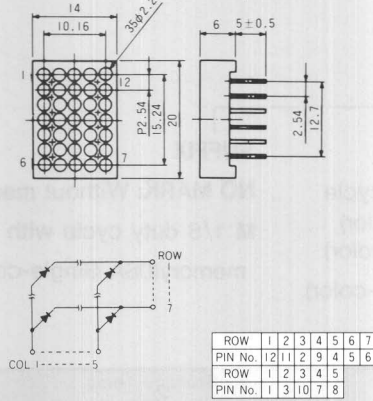
(IFM values of MD0657M-R apply under the conditions, $t_w \leq 0.2\text{ms}$ and the duty cycle $\leq 1/5$.)

▼ CHARACTERISTICS BY SHAPE

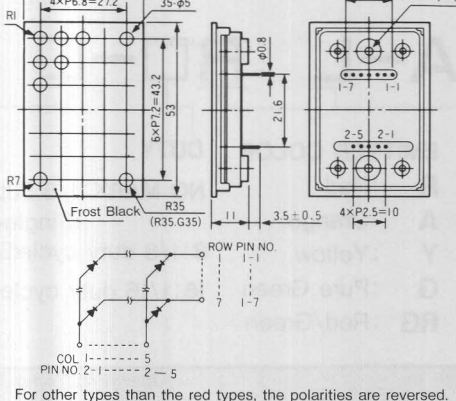
Ta=25°C

Shape		Color	Type No.	Emitted Color	Dot Size	Dot Pitch	Dot Format	Electro-Optical Characteristics Luminous Intensity I _v /dot	
								MIN.	I _F
14×20 	37×53 	Single-color	MD0657M-R (14×20)	Red	φ2.2	2.54	5×7	1	10
			MD2057C-R (37×53)	Red				3	20
			MD2057C-A (37×53)	Orange				2	20
			MD2057C-Y (37×53)	Yellow				2	20
			MD2057C-G (37×53)	Green				2	20
□32 		Bi-color	MD2057C-RG (37×53)	Red	φ5	Y 7.2 X 6.8	5×7 (35dots)	3	20
			Green	2				20	
				2				20	
				2				20	
				2				20	
□32 		Single-color	MD1208C-R	Red	φ3	4	8×8 (64dots)	3	20
			MD1208C-A	Orange				2	20
			MD1208C-Y	Yellow				2	20
			MD1208C-G	Green				2	20
□64Chip Type 		Bi-color	MD1208C-KRG-ARG	Red	φ3	4	16×16 (256dots)	3	20
			Green	2				20	
				2				20	
				2				20	
				2				20	
□64Chip Type 		Single-color	MD2516C-R	Red	φ3	4	16×16 (256dots)	3	20
			MD2516C-A	Orange				2	20
			MD2516C-Y	Yellow				2	20
			MD2516C-G	Green				2	20
□96Mold Type 		Bi-color	MD2516C-KRG-ARG	Red	φ3	4	16×16 (256dots)	3	20
			Green	2				20	
				2				20	
				2				20	
				2				20	
□96Mold Type 		Single-color	MD3716M-R	Red	φ5	6	16×16 (256dots)	3	20
			MD3716M-A	Orange				2	20
			MD3716M-Y	Yellow				2	20
			MD3716M-G	Green				2	20
□96Lamp Type 		Bi-color	MD3716M-RG	Red	φ5	6	16×16 (256dots)	3	20
			Green	2				20	
				2				20	
				2				20	
				2				20	
□96Lamp Type 		Single-color	MD3716L-R	Red	φ5	6	16×16 (256dots)	3	20
			MD3716L-A	Orange				3	20
			MD3716L-Y	Yellow				3	20
			MD3716L-G	Green				2	20
□96Lamp Type 		Bi-color	MD3716L-RG	Red	φ5	6	16×16 (256dots)	1.5	20
			Green	2				20	
Units					mm	mm	dot	mcd	mA

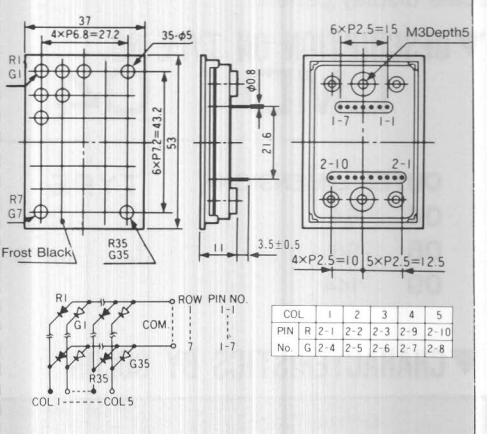
5×7 SINGLE COLOR TYPE (MD0657M-R)



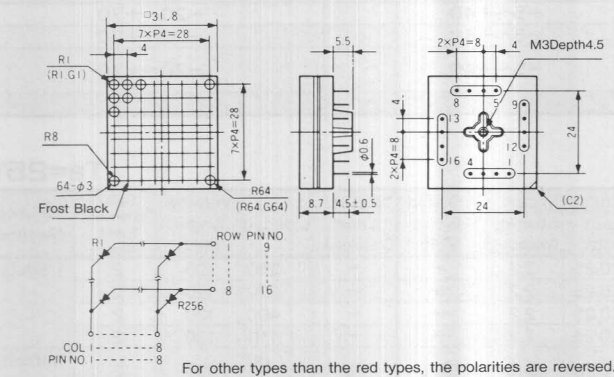
5×7 SINGLE COLOR TYPE (MD2057C-R)



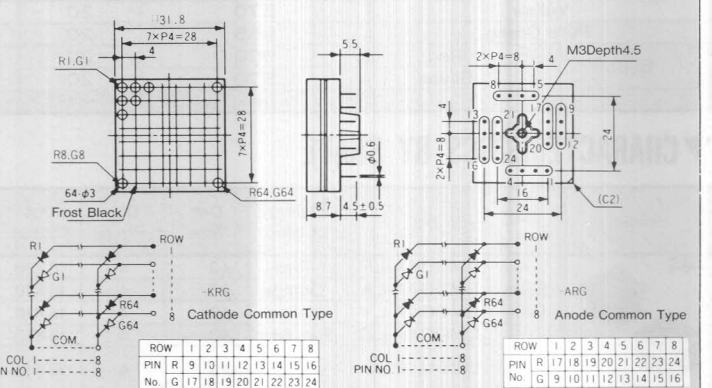
5×7 BI-COLOR TYPE (MD2057C-RG)



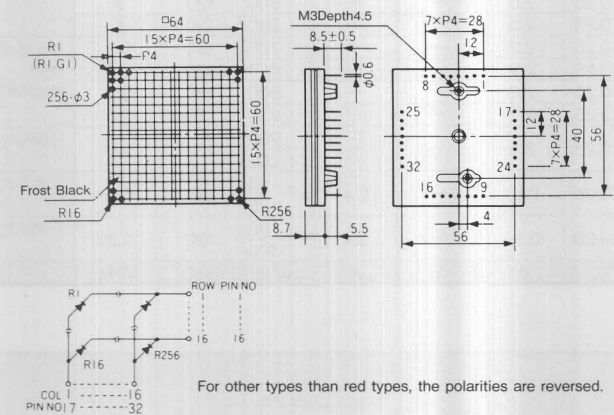
32 SINGLE COLOR TYPE (MD1208C-R)



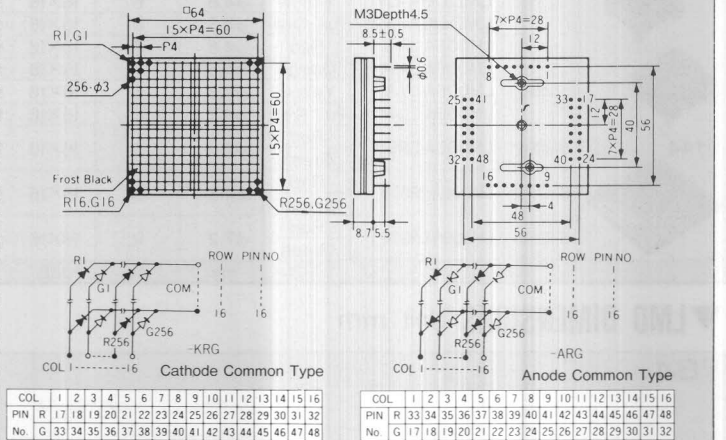
32 BI-COLOR TYPE (MD1208C-□RG)



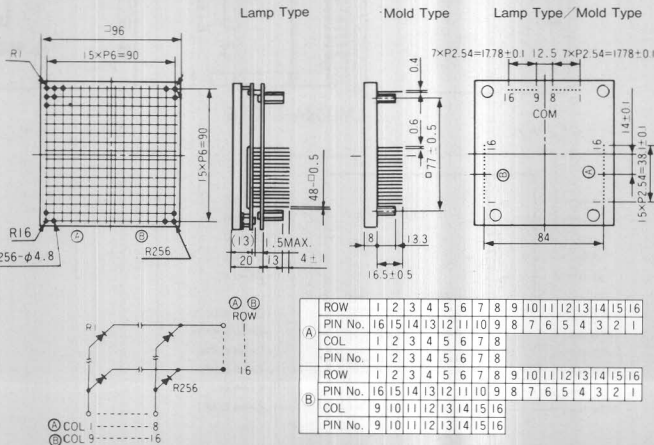
64 SINGLE COLOR TYPE (MD2516C-R)



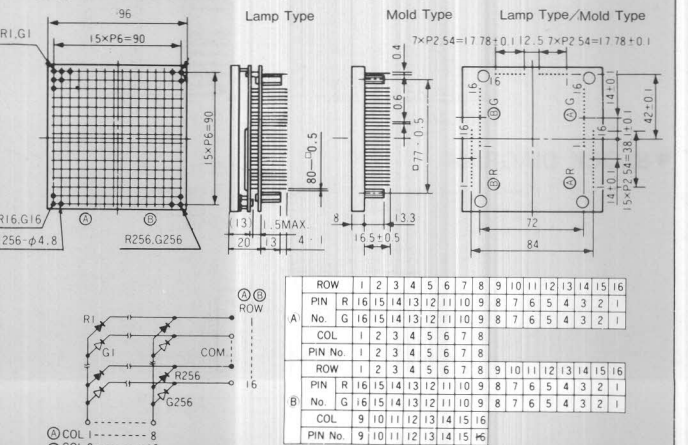
64 BI-COLOR TYPE (MD2516C-□RG)



96 SINGLE COLOR TYPE (MD3716□-R)



96 BI-COLOR TYPE (MD3716□-RG)



LED GRAPHIC DISPLAY UNIT

These LED graphic display units use super-bright LEDs to provide a sharp, bright display in either single colors or combinations to make three colors. They feature built-in drive circuitry and X-Y stackable to enable configuration of large scale display panels.

▼DESCRIPTION ON TYPE NO.

LMD 04 A-L R□-□

OUTER DIMENSIONS

04 : □64
06 : □96
09 : □144

TYPE

C : Chip
L : Lamp

EMITTED COLOR

R : Red
A : Orange
Y : Yellow
G : Pure Green
RG : Red/Green

DUTY

NO MARK : 1/8 duty cycle
 (Single-color)
8 : 1/8 duty cycle (Bi-color)
16 : 1/16 duty cycle (Bi-color)

SUFFIX

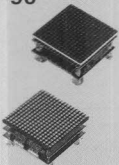
NO MARK : Without memory
M : 1/8 duty cycle with
 memory (06A Single-color)

▼CHARACTERISTICS BY COLOR

Emitted Color	Peak Wavelength λ_p		Operating Temp. Topr	Storage Temp. Tstg
	TYP	IF		
Red	660	20	-5~+40	-20~+70
Orange	605	20	-5~+40	-20~+70
Yellow	570	20	-5~+40	-20~+70
Pure Green	555	20	-5~+40	-20~+70
Bi-Color	Red	20	-5~+40	-20~+70
	Green	20		
Units	nm	mA		°C

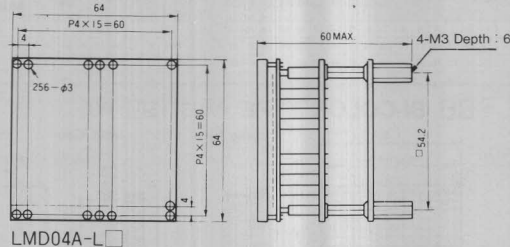
▼CHARACTERISTICS BY SHAPE

Ta=25°C

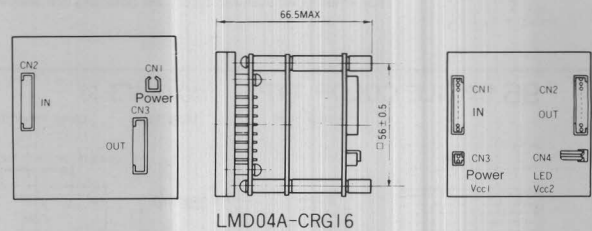
Shape	Type No.		Emitted Color	Dot Size	Dot Pitch	Dot Format	Logic Circuit		Display circuit		Luminosity	Viewing Angle MIN.	Data Transmission Speed Max.	Driving Method
							Input Volt.	Current Consumption	Input Volt.	Current Consumption				
 □64	Single Color	LMD04A-LR	Red	φ3	4	16×16	5±0.25	2.2	—	—	280	120	2	1/8duty
		LMD04A-LA	Orange	φ3	4	16×16	5±0.25	2.2	—	—	320	120	2	
		LMD04A-LY	Yellow	φ3	4	16×16	5±0.25	2.2	—	—	490	120	2	
		LMD04A-LG	Pure Green	φ3	4	16×16	5±0.25	2.2	—	—	110	120	2	
 □96	Bi-Color	LMD04A-CRG16	Red Green	φ3	4	16×16	5±0.25	0.16	5~6	1.8	60 90	120	2	1/16duty
			LMD06A-LR	Red	φ4.8	6	16×16	5±0.25	2.0	—	—	700	120	5
	LMD06A-LA	Orange	φ4.8	6	16×16	5±0.25	2.0	—	—	600	120	5		
	LMD06A-LY	Yellow	φ4.8	6	16×16	5±0.25	2.0	—	—	900	120	5		
	Single Color	LMD06A-LG	Pure Green	φ4.8	6	16×16	5±0.25	2.0	—	—	230	120	5	1/8 duty with memory
		LMD06A-LR-M	Red	φ4.8	6	16×16	5±0.25	2.2	—	—	700	120	0.8	
		LMD06A-LA-M	Orange	φ4.8	6	16×16	5±0.25	2.2	—	—	600	120	0.8	
		LMD06A-LY-M	Yellow	φ4.8	6	16×16	5±0.25	2.2	—	—	900	120	0.8	
		LMD06A-LG-M	Pure Green	φ4.8	6	16×16	5±0.25	2.2	—	—	230	120	0.8	
		Bi-color	LMD06A-CRG8	Red Green	φ4.8	6	16×16	5±0.25	3.8	—	—	200 200	120	
LMD06A-CRG16	Red Green			φ4.8	6	16×16	5±0.25	0.16	5~7	2.4	75 75	120	2.0	1/16duty
Bi-Color	LMD09A-LRG16		Red Green	φ7.2	9	16×16	5±0.25	0.16	5~7	2.4	80 105	120	2.0	1/16duty
Units				mm	mm	dot.	V	A	V	A	cd/m ²	deg.	MHz	

▼LMD DIMENSIONS Unit:mm

□64

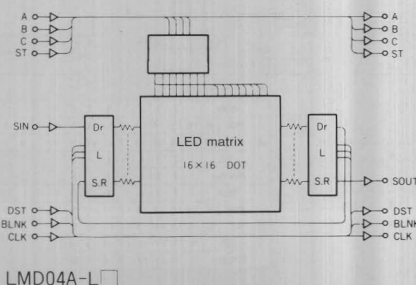


LMD04A-L□

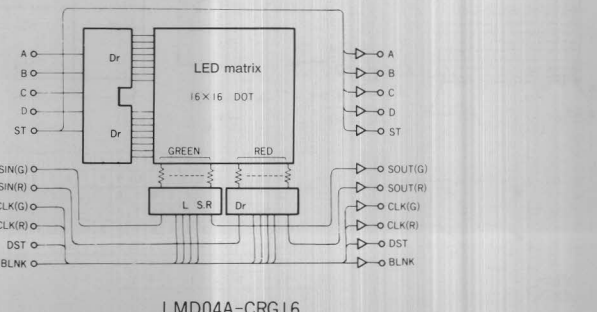


LMD04A-CRG16

▼BLOCK DIAGRAM

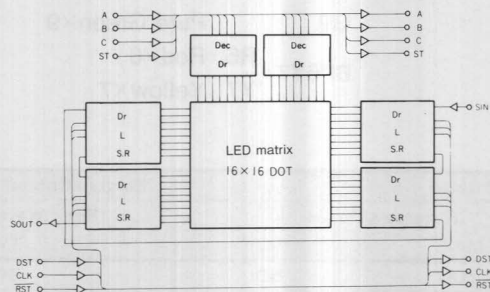
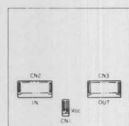


LMD04A-L□

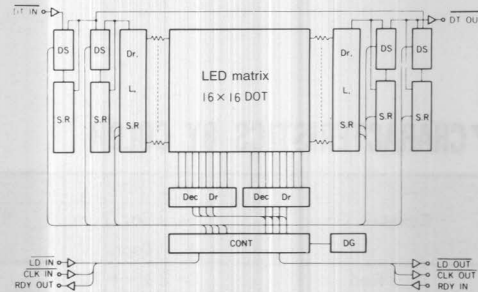
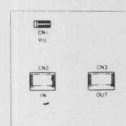


LMD04A-CRG16

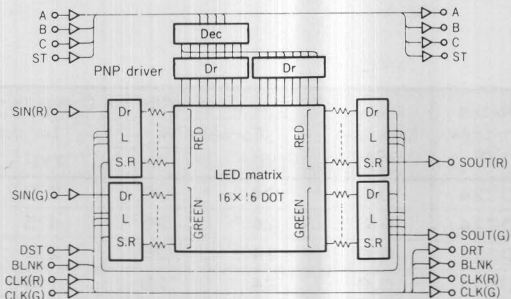
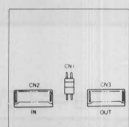
▼REAR CONNECTOR PIN ARRANGEMENT/BLOCK DIAGRAM



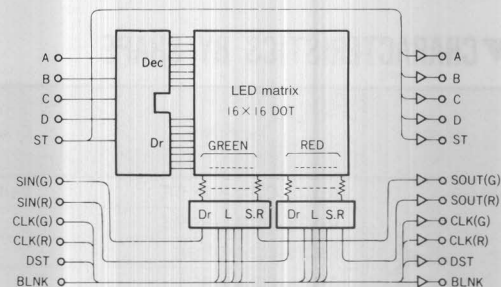
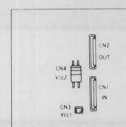
LMD06A-L



LMD06A-L-M

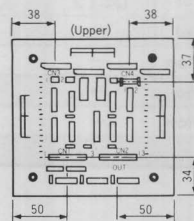
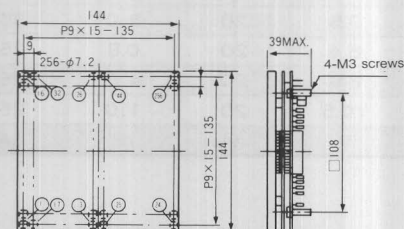


LMD06A-CRG8



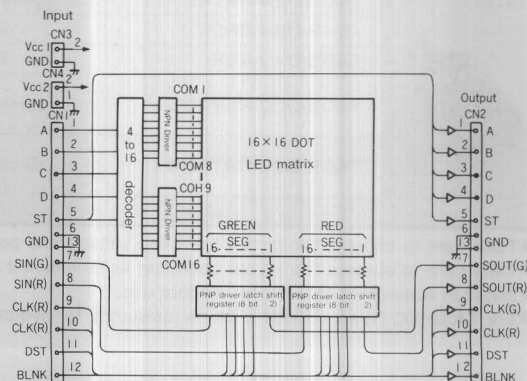
LMD06A-CRG16

144



Rear connector pin arrangement

Note : The data indicated within the circles is the input sequence.



LMD09A-LRG16

◀TERMINOLOGY USED IN THE BLOCK DIAGRAM▶ Dr:DRIVER, Dec:DECODER, DS:DATA SELECTOR, L:LATCH, S.R:SHIFTREGISTER, CONT:CONTROL-
LER, PG:PULSE GENERATOR

BULB-TYPE LED LAMP

STANLEY *Big*

By combining advanced super-bright LED technology with bulb production technology, Stanley has produced these products as the world's first bulb-type outdoor LEDs. Compared to conventional incandescent bulbs, they offer long life and a variety of colors, making them suitable for information display boards and decorative outdoor displays.

▼ DESCRIPTION ON TYPE NO.

T40 B-024-R4Y5 E

Bulb Configuration

R52: ϕ 52

R62: ϕ 62

T25: ϕ 25

T40: ϕ 40

Bulb Finish

B: With Black Tube

C: Clear Bulb

S: With Sputtering

Rated Voltage

012: 12V

024: 24V

100: 100V

※000:

Provide a series resistance for overcurrent protection

LED Combination

R4Y5< R4: Red×4

Y5: Yellow×5

R9: Red×9

5BR9: Red×9

BR9: Red×9

A9: Orange×9

Y9: Yellow×9

G9: Pure Green×9

BR6Y7< R6: Red×6

Y7: Yellow×7

Base type

E: E-26

BW: B22D

L3: 3Leads.

▼ CHARACTERISTICS BY COLOR

T=25°C

Emitted Color	Absolute Maximum Ratings				Electro-Optical Characteristics	
	Operating Temp. Topr	Storage Temp. Tstg	Reverse Current I _R		Peak Wavelength λ_p	
			MAX.	V _R	TYP.	
Red	-30~+70	-30~+100	100	50	660	
Orange	-30~+70	-30~+100	100	50	605	
Yellow	-30~+70	-30~+100	100	50	570	
Green	-30~+70	-30~+100	100	50	555	
Bi-color	Red	-30~+70	100	50	660	
	Yellow	-30~+70	100	50	570	
Units	°C		μ A	V	nm	

▼ CHARACTERISTICS BY SHAPE

Ta=25°C

Shape	Type No.	Emitted Color		Rated Voltage VF	Power Consumption Pd	Electro-Optical Characteristics				fig
						Forward VF		Luminous Intensity Iv		
						TYP.	IF	TYP.	IF	
	R52S-024-R4Y5E	Yellow Orange		DC24	0.6	24	25	5.0	25	1
	R52S-024-5BR9E	Red		DC24	0.6	24	25	4.5	25	
	R52S-024-BR9E	Red		DC24	0.6	24	25	2.0	25	
	R52S-024-A9E	Orange		DC24	0.6	24	25	1.5	25	
	R52S-024-Y9E	Yellow		DC24	0.6	24	25	2.5	25	
	R52S-024-G9E	Green		DC24	0.6	24	25	0.8	25	
	R52S-012-R5E	Red		DC12	0.3	12	25	6.0	25	
	T40B-024-R4Y5E	Yellow Orange		DC24	0.6	24	25	5.0	25	2
	T04B-024-BR9E	Red		DC24	0.6	24	25	2.0	25	
	T40B-012-R5E	Red		DC12	0.3	12	25	6.0	25	
	T40B-000-R5Y4BW※	Bi-color	Red	—	—	9.5	20	5.0	25	3
			Yellow	—	—	8.4	20	0.8	25	
	T40B-000-R4Y5BW※	Bi-color	Red	—	—	6.8	20	4.0	25	
			Yellow	—	—	10.5	20	1.0	25	
Units				V	W	V	mA	cd	mA	

● Take care to observe the proper operating voltage and polarity.

● Take care to observe the proper operating environmental conditions.

● Install in waterproof sockets for outdoor use.

※ For T40B-000 types, provide a series resistance for overcurrent protection.

High-visibility Type R52S, R62S, R62B

Bi-color type with lead wire

Emitted color.....red, yellow, yellow-orange(mixed color)

Environmental Conditions

Type No.	Operating Temperature	Storage Temperature
R52S-000-R4Y5L3	-30°C	-30°C
R52S-000-R4Y5L3-2		
R62S/B-000-R5Y9L3	+60°C	+85°C
R62S/B-000-R9Y5L3		

CHARACTERISTICS BY SHAPE

Ta=25°C

Shape	Type No.	Emitted Color	Rated current (mA)	Forward Voltage (V)	Central luminous intensity (cd)	Socket	fig.
	R52S type	R52S-000-R4Y5L3	Red LED circuit 25mA	VFR 7.6	R4-4	SE-26A	4
		-R4Y5L3	Yellow LED circuit 25mA	VFY 10.5	Y5-1.0	waterproof type	
		R52S-000-R4Y5L3-2	Red LED circuit 25mA	VFR 7.6	R4-2	SE-26A	
		-R4Y5L3-2	Yellow LED circuit 25mA	VFY 10.5	Y5-0.5	waterproof type	
	R62S type with sputtering	R62S-000-R5Y9L3	Red LED circuit 25mA	VFR 9.5	R5-5	SE-26A	5
		-R5Y9L3	Yellow LED circuit 25mA	VFY 18.9	Y9-1.8	waterproof type	
		R62S-000-R9Y5L3	Red LED circuit 25mA	VFR 17.1	R9-9	SE-26A	
		-R9Y5L3	Yellow LED circuit 25mA	VFY 10.5	Y5-1.0	waterproof type	
	R62B type with clear bulb cover	R62B-000-R5Y9L3	Red LED circuit 25mA	VFR 9.5	R5-5	SE-26A	5
		-R5Y9L3	Yellow LED circuit 25mA	VFY 18.9	Y9-1.8	waterproof type	
		R62B-000-R9Y5L3	Red LED circuit 25mA	VFR 17.1	R9-9	SE-26A	
		-R9Y5L3	Yellow LED circuit 25mA	VFY 10.5	Y5-1.0	waterproof type	

※The forward voltage and central luminous intensity at a forward current IF=20mA.

※Determine the voltage and current before use.

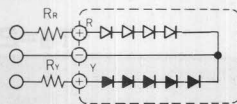
※Series resistance are necessary for each lamp.

※Please request detailed information for each lamp whenever it is necessary.

Connecting method and protective resistance value calculation example

Provide series resistance for overcurrent prevent because heat damage may occur if excess current flows to the LED. (Use resistors with a rating greater than 1w.)

For R4Y5



When the lamp lights at 24V DC IF=25mA, set the RrRy as follows.

$$R_r = \frac{V - V_{FR}}{I_F} = \frac{24 - 7.6}{0.025} = 656\Omega$$

$$R_y = \frac{V - V_{FY}}{I_F} = \frac{24 - 8.4}{0.025} = 540\Omega$$

Rr, Ry: Protective resistance of Red and Yellow

V: Input voltage

VFR, VFY: Direct current voltage of Red and Yellow

IF: Rated current

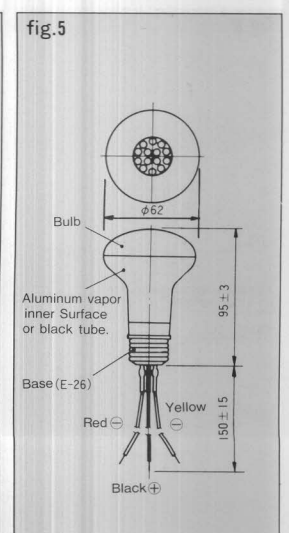
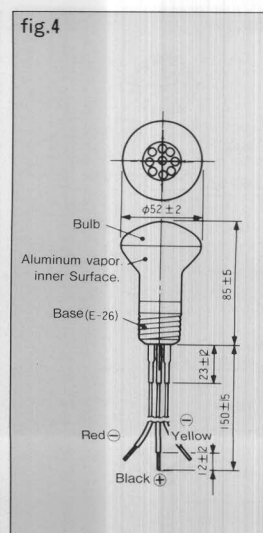
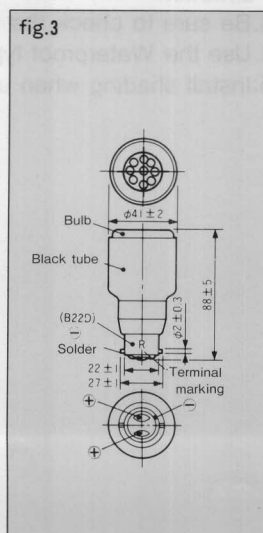
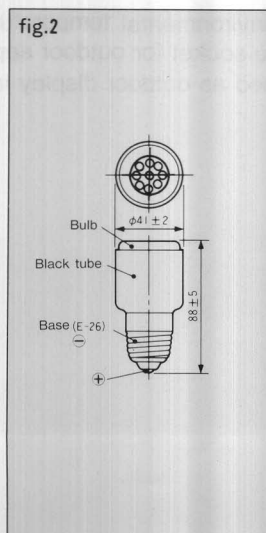
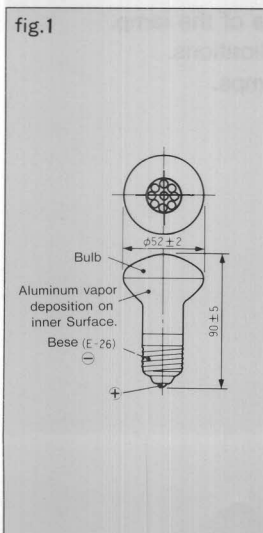
Special Socket SE-26A(Waterproof type)



Precautions

1. Always use the special socket.
2. Always connect the series resistance.
3. Be sure to install the lamp in the correct position for the light direction.
4. Check the ambient temperature.
5. The lighting voltage varies according to the lamp.
It also varies for static and dynamic lighting.
6. Provide current within the specified values.

DIMENSIONS Unit: mm



BULB-TYPE LED LAMP / EMERGENCY LED LAMP

R62S type (for 100V AC)

Absolute Maximum Rating

Item	Symbol	Conditions	Rating	Units
Voltage	V	Ta = -30~+60°C	110	V
Operating temperature	T _{opr}	—	-30~+60	°C
Storage temperature	T _{stg}	—	-30~+85	°C

▼ CHARACTERISTICS BY SHAPE

R62S Type (with sputtering)

Ta=25°C

Shape	Type No.	Emitted Color	Voltage (V)	Current (mA)	Power Consumption (W)	Center luminous intensity (cd)	Base	fig.
	R62S-100-R5Y9E	Yellow Orange	100	23	2.3	7	E-26	6
	R62S-100-BR14E	Red	100	26	2.6	2.5	E-26	
	R62S-100-Y14E	Yellow	100	23	2.3	3	E-26	
	R62S-100-G14E	Green	100	23	2.3	1	E-26	
	R62S-100-A14E	Orange	100	23	2.3	2	E-26	

■ Precautions

1. Use 100V AC.
2. Be sure to check the environmental temperature of the lamp.
3. Be sure to install the lamp so the light is emitted to the correct direction.
4. Use the Special socket SE-26A(Waterproof type)for outdoor applications.
5. Can be combined with 100 Voltage type flasher unit.
6. Install shading when used as outdoor display lamps.

T25B Type (for information displays)

▼ CHARACTERISTICS BY SHAPE

Ta=25°C

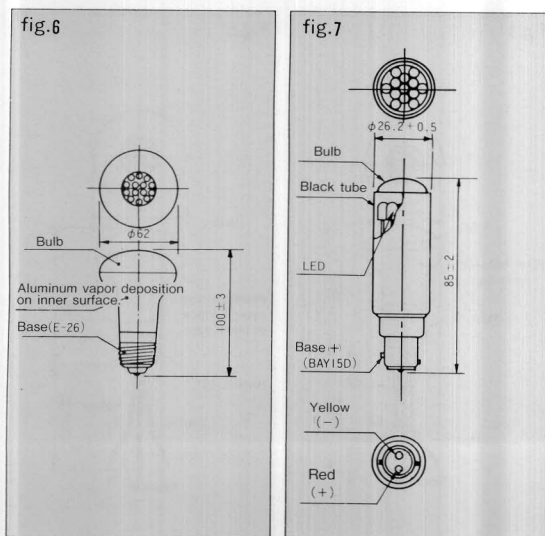
Shape	Type No.	Emitted Color		No. of LED	Absolute Maximum Ratings				Electro-Optical Characteristics						fig.
					Power Dissipation Pd	Forward Current If	Operating Temp Topr.	Storage Temp Tstg	Forward Voltage Vf		Reverse current Ir		Luminous Intensity Iv	Peak Wavelength λp TYP	
	T25B-000-BR6Y 7BW	Bi-color	Red	6	0.28	25	-30~+60	-30~+85	10.2	20	100	24	1.2	660	7
			Yellow	7	0.39	25			14.7	20	100	28	1.7	570	
Units				pcs.	W	mA	°C		V	mA	μA	V	cd	nm	

- The luminous intensity I_v and peak wavelength λ_p are measured when I_F=20mA.
- The power dissipation P_d and luminous intensity I_v are the values when all chips are lit.
- The peak forward current I_{FM}=100mA Max. when t_w≤1/20.

■ Precautions

1. Series resistance is not connected inside the lamp.
2. Be sure to install the lamp in so that the light is emitted to the correct direction.
3. Be sure to check the environmental temperature of the lamp.
4. Use the Waterproof type socket for outdoor applications.
5. Install shading when used as outdoor display lamps.

▼ DIMENSIONS Unit: mm



LOD SERIES

These devices use super bright LEDs and feature waterproof construction. They are ideal for outdoor use, such as railroad and highway sign board applications, and so on.

▼ CHARACTERISTICS BY SHAPE

Ta=25°C

Shape	Type No.	Emitted Color		No. of LED	Absolute Maximum Ratings				Electro-Optical Characteristics						fig.
					Power Dissipation Pd	Forward Current If	Operating Temp. Topr	Storage Temp. Tstg	Forward Voltage VF		Reverse current IR		Luminous Intensity MIN	Peak Wavelength λp TYP	
									TYP	IF	MAX	VR			
	LOD240RY-P	Bi-color	Red	7	0.4	30			12.0	20	20	28	0.7	660	8
			Yellow	8	0.58	30			17.0	20	20	32	0.8	570	
	LOD240R-P	Red	7	1.0	30	-40~+60	-40~+100	12.0	20	20	28	1.5	660		
			8					13.5	20	20	32				
	LOD240Y-P	Yellow	7	1.09	30			15.0	20	20	28	1.5	570		
			8			17.0	20	20	32						
	LOD500RY-L	Bi-color	Red	20	0.95	50	-30~+50	-30~+85	18	40	20	40	6	660	9
			Yellow	30	1.65	75			21	60	20	40	2.4	570	
			Units				pcs.	W	mA	C	V	mA	μA	V	

- The luminous intensity Iv and peak wavelength λp are measured when If=20mA.
- The power dissipation Pd and luminous intensity If of LOD240R-P and LOD240Y-P are for all LEDs lighted.
- The peak forward current IFM=100mA Max. when tw≤1/20.
- Keep the aluminum case temperature below 80°C when operating.
- Series resistance are necessary for each lamp.

EMERGENCY LED LAMP(BU2E)

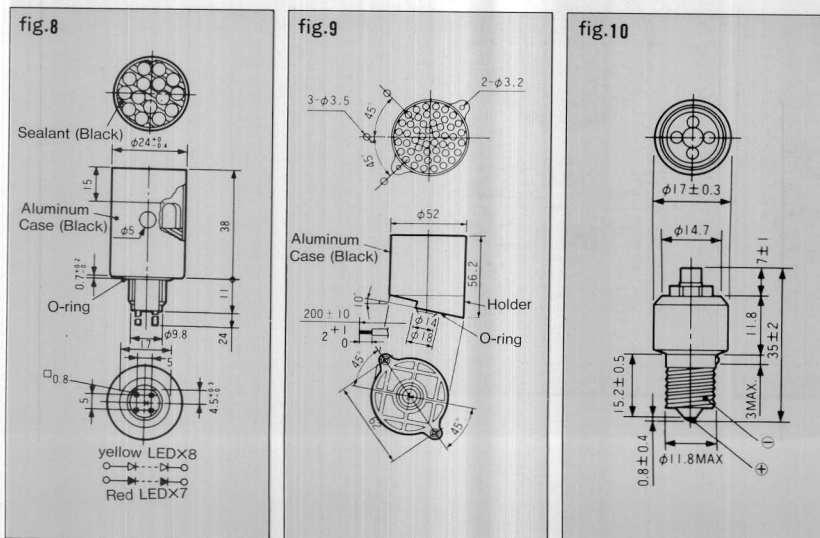
These emergency lamps use super-bright LED and have bulb-type bases. They were developed specifically for emergency lamp. In particular, the BU2E12-24R can be used as direct replacements in existing 24VDC powered equipment without regard to polarity of supply voltage.

▼ CHARACTERISTICS BY SHAPE

Ta=25°C

Shape	Type No.	Absolute Maximum Ratings				Electro-Optical Characteristics				fig.
		DC input VDC	AC input VAC	Operating Temp.	Storage Temp.	DC Current If		Luminous Intensity Iv TYP	Peak Wavelength λp TYP	
	BU2E12-24R	35	35	-10~+40	-20~+70	20	24	30	660	10
	BU2E12-06R	7	—	-10~+40	-20~+70	21	6	30	660	
	Units	V	Vrms.	°C	°C	mA	V	mcd	nm	

▼ DIMENSIONS Unit: mm



ULTRA HIGH POWER INFRARED LED

Stanley infrared LEDs, including the super-intensity, high-speed DN Series, are available in four wavelengths (850,880, 925, 950nm) as well as in a wide variety of package types.

A wide variety of photo detector can be accommodated, including phototransistors and pin photodiodes, by selecting the package shape, enabling the ideal light source-receiver combination. These devices are also used in photo interrupter reflector sensor which serve as most advanced optical sensor technology.

▼DESCRIPTION ON TYPE NO.

AN 305

Suffix

●Infrared LED

AN:950nm(GaAs)

BN:925nm(GaAs)

CN:880(GaAlAs)

DN:850nm(GaAlAs)

●Phototransistor

PS:800nm(Si-Epitaxial)

PD:800nm(Si-Epitaxial) Darlington Connection

PS□□□2:880nm(Si)

●PIN Photodiode

PP:950nm(Si)

●Optoswitch

KU:Emitter and detector

▼CHARACTERISTICS BY WAVELENGTH

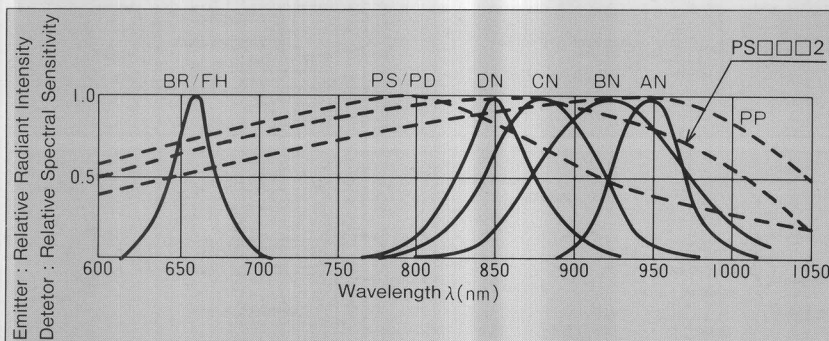
Ta=25°C

Type No.	Material	Absolute Maximum Ratings						Electro-Optical Characteristics																									
		Power Dissipation	Forward Current	Peak Forward Current	Reverse Voltage	Operating Temp.	Storage Temp.	Forward Voltage V _F			Reverse Current I _R		Capacitance C _O	Wavelength			Cut-off Frequency F _C *		Response Time T _r ·T _f														
		P _d	I _F	I _{FM}	V _R	T _{opr}	T _{stg}	TYP.	MAX.	I _F	MAX.	V _R	TYP.	TYP.	λ _p	Spectral line half Δλ width	TYP.	I _F	TYP.	I _F													
AN	Type																																
	501	GaAs	75	50	500	5	-30~+85	-30~+100	1.3	1.5	50	10	5	20	950	45	50	50	700	50													
	111																																
	T0-18		150	100	1,000		-40~+125	-55~+125	1.2	1.4	30	50							30	30													
BN																																	
	501	GaAs	60	40	500	4	-30~+85	-30~+100	1.2	1.5	20	10	4	90	925	50	20	1.8	20	200	20												
	T0-18				100		50	1,000														-30~+125	-30~+125										
								-30~+85														-30~+100											
CN																																	
	501	GaAlAs	75	50	500	5	-30~+85	-30~+100	1.45	1.8	50	10	5	20	880	65	50	0.65	50	500	50												
	T0-18				150		100	1,000														-40~+125	-55~+125										
								-30~+85														-30~+100											
DN																																	
	T0-18	GaAlAs	150	100	1,000	5	-40~+125	-55~+125	1.55	2.0	50	100	5	65	850	40	50	30	50	10	50												
								-30~+85														-30~+100											
Units		mW	mA		V	°C		V	mA	μA	V	pF	nm	mA	MHz	mA _{DC}	nsec	mA															

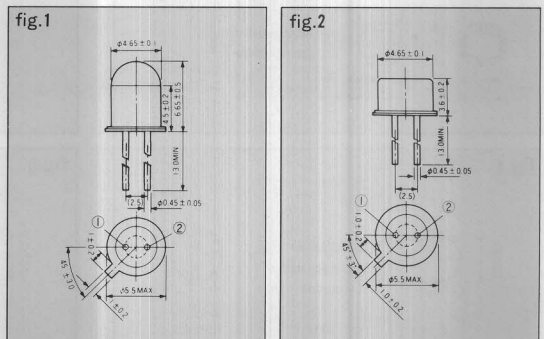
*If=50mA DC+10mAp-p for AN, CN and DN

If=20mA DC+4mAp-p for BN

▼SPECTRAL DISTRIBUTION



▼PACKAGE DIMENSIONS Unit:mm



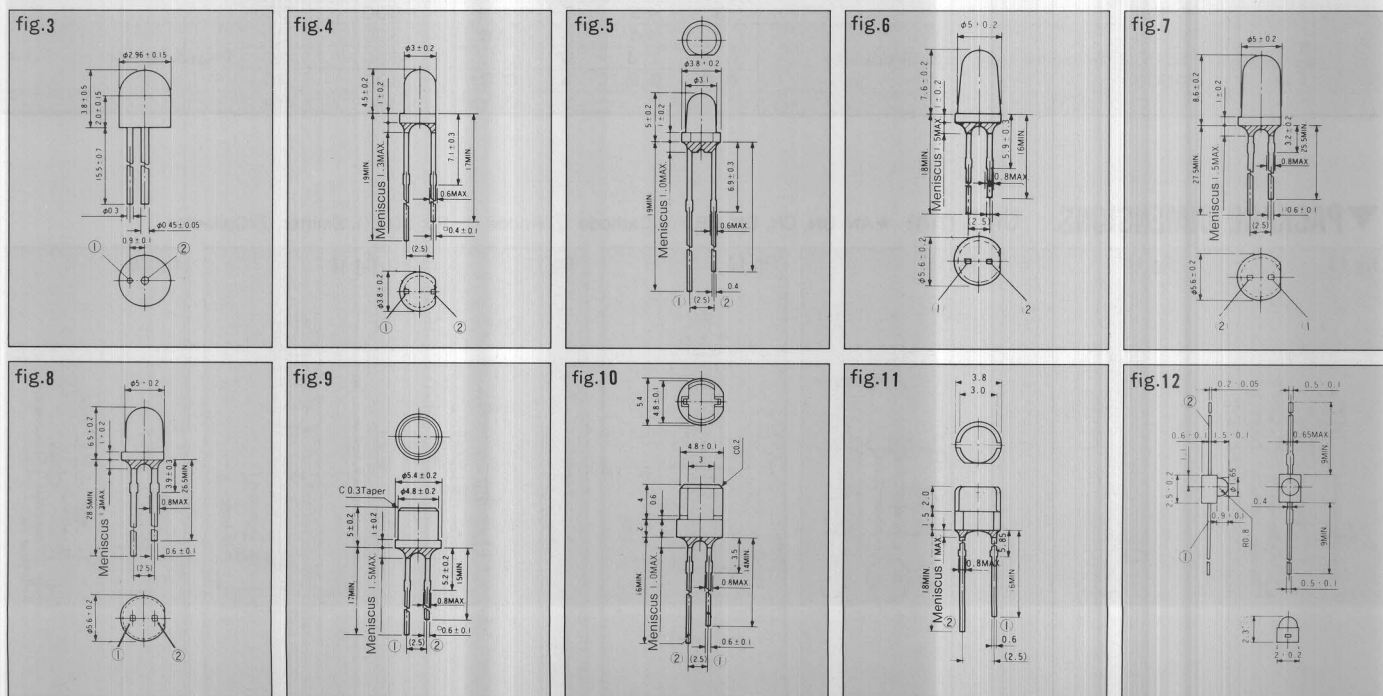
- AN Type / ①: Anode ②: Cathode
- BN, CN and DN Type / ①: Cathode ②: Anode
- PS and PD Type / ①: Emitter ②: Collector
- PP Type / ①: Anode ②: Cathode

▼ CHARACTERISTICS BY SHAPE

Ta=25°C

Shape	Type No.	Features	Peak Wavelength λ_p		Radiant Intensity $I_e(P_o)$		Half Intensity Angle $\Delta\theta$	Applications	fig.
			TYP.	I _F	TYP.	I _F			
	AN106	TO-18 can type	950	50	25.0(3.5)	50	4	Optical switches Photosensors	1
	BN101	High-directivity lens	925	20	6.5(—)	20	12		
	CN106	High reliability	880	50	30.0(4.5)	50	6		
	DN106		850	50	70.0(7.0)	50	3		
	AN202	TO-18 can type	950	50	2.5(4.0)	50	54	Optical switches Photosensors	2
	BN201	Flat lens	925	20	0.3(—)	20	74		
	CN202	High reliability	880	50	3.0(5.0)	50	30		
	DN202		850	50	4.0(8.0)	50	38		
	AN111-02	3-mm dia. Ceramic type Wide directivity	950	30	3.0(4.0)	30	110	Photosensors	3
	AN303	3-mm dia.	950	50	9.0(5.0)	50	15	Remotecontrol	4
	CN303	Molded epoxy type	880	50	12.0(8.0)	50	20	Photosensors	
	AN306	Compact	950	50	14.0(5.0)	50	30	Remotecontrol	
	CN306	High directivity	880	50	18.0(7.0)	50	24	Photosensors	5
	AN305	5-mm dia.	950	50	25.0(8.0)	50	18	Remotecontrol/Optical switches	
	BN301	Molded epoxy type	925	20	7.0(—)	20	12	Optical switches	
	CN305	High directivity	880	50	30.0(8.0)	50	18	Remotecontrol/Optical switches	6
	DN305	High directivity	850	50	80.0(12.0)	50	15	Wireless data transmission Remotecontrol	
	AN304		5-mm dia.	950	50	15.0(9.0)	50	50	
	CN304	Molded epoxy type	880	50	20.0(9.0)	50	35	Optical switches	8
	DN304	Wide directivity	850	50	30.0(15.0)	50	35	Wireless data transmission Remotecontrol	
	BN401	5-mm dia.	925	20	0.8(—)	20	96	Optical switches	
	DN401	Molded epoxy type	850	50	7.0(15.0)	50	50	9	
	BN511	5-mm dia.	925	20	0.8(—)	20	86		
	CN511	Molded epoxy type	880	50	6.0(8.0)	50	42	Optical fiber	10
DN511	High accuracy	850	50	9.0(12.0)	50	28	Autofocus mechanisms		
	DN311	High input type	850	50	3.5(10.0)	50	110	Optical fiber	11
AN501	1.6-mm dia.	950	50	5.0(6.0)	50	16	Autofocus mechanisms		
	BN501	Axial-lead	925	20	1.5(—)	20	52	Photosensors	12
	CN501	Ultracompact	880	50	6.0(9.0)	50	18		
	BN504	Side-view type	925	20	1.0(—)	20	100		
	CN504	Wide directivity	880	50	5.0(7.0)	50	44	Photosensors	13
	DN504	Wide directivity	850	50	8.0(12.0)	50	60		
	AN505		950	50	4.0(6.0)	50	5		
	BN505	Side-view type	925	20	1.5(—)	20	26	Photosensors	14
	DN505	High directivity	880	50	5.0(7.0)	50	7		
	CN505	High directivity	850	50	5.0(7.0)	50	7		
Units			nm	mA	mW/sr	(mW)	mA	deg.	

▼ PACKAGE DIMENSIONS Unit:mm



● AN Type / ①: Anode ②: Cathode ● BN, CN and DN Type / ①: Cathode ②: Anode
● PS and PD Type / ①: Emitter ②: Collector

■ PHOTOTRANSISTOR

▼ CHARACTERISTICS BY MATERIAL

PS:Phototransistor **PD:**Photo-Darlington Transistor

 $T_a = 25^\circ\text{C}$

Type NO.		Absolute Maximum Ratings						Electro-Optical Characteristics						
		Collector Dissipation	Collector-Emitter Breakdown Voltage V _{CEO}	Emitter-Collector Breakdown Voltage V _{ECO}	Collector Current I _C	Operating Temp. T _{opr}	Storage Temp. T _{stg}	Collector-Emitter Dark Current I _{CEd}		Response Time Tr•Tf				Peak Sensitivity Wavelength λ _p
								MAX.	V _{CEP}	TYP.	V _{CE}	I _C	R _L	
PS	T0-18	150	30	5	50	-30~+125	-30~+150	0.2	10	5	10	2	100	800
	502	60			20	-30~+ 85	-30~+100							
		100			30									
PS	T0-18	150	30	5	50	-30~+125	-30~+150	0.2	10	5	10	2	100	880
	502	60			20	-30~+ 85	-30~+100							
	□□□2	100			30									
PD	T0-18	150	20	5	50	-30~+125	-30~+150	1.0	10	400	10	2	100	800
	502	60			20	-30~+ 85	-30~+100							
		100			30									
Units		mV	V	V	mA	°C		μA	V	μsec	V	mA	Ω	nm

▼ CHARACTERISTICS BY SHAPE (PHOTO TRANSISTOR)

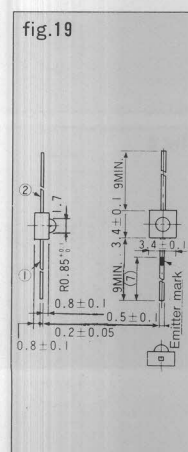
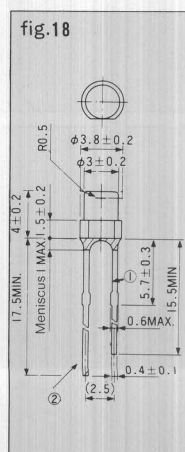
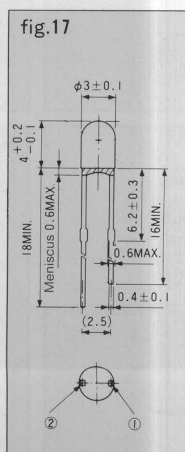
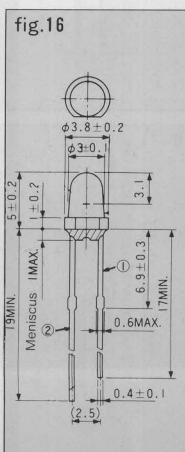
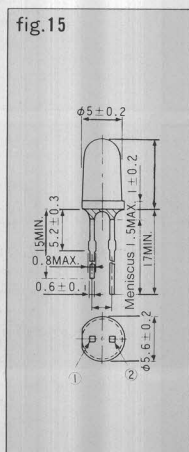
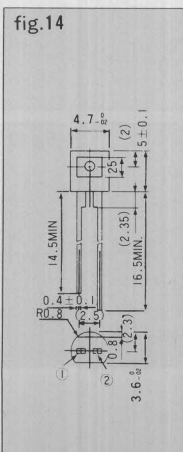
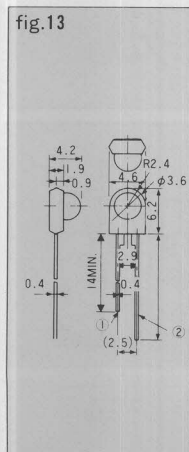
 $T_a = 25^\circ\text{C}$

Shape	Type No.	Features	Photo Current I _c				Peak Sensitivity Wavelength λ _p TYP.	Half Intensity Angle Δθ	Application	fig.
			MIN.	TYP.	V _{CE}	E _e ※				
	PS101	TO-18 can type, high directivity lens, high reliability	1.5	6	5	1	800	14	Photo Sensor	1
	PD101		3	15	5	0.01	800	6	Photo Switch	
	PS201	TO-18 can type, flat lens, high reliability	0.6	15	5	10	800	90	Photo Sensor	2
	PS2022		0.1	2.5	5	1	880	90	Photo Sensor	
	PD201		2	6	5	0.01	800	90	Photo Switch	
	PS1142	3-mm dia, ceramic type, wide directivity	0.1	0.5	5	0.5	880	-	Photo Sensor	3
	PS302	5-mm dia, molded epoxy type, high-directivity lens	1	5	5	1	800	22	Photo Sensor	15
	PS3022		1.5	7	5	1	880	22	Photo Sensor	
	PD302		2	12	5	0.01	800	18	Photo Switch	
	PS3062	3-mm dia, molded epoxy type, high-directivity lens	1.2	6	5	1	880	20	Photo Sensor	16
	PD306		0.5	2	5	0.01	800	18	Photo Switch	
	PS3072	3-mm dia, molded epoxy type	2	7	5	1	880	110	Photo Sensor	17
	PD307		0.8	3	5	0.1	800	110	Photo Switch	
	PS401	5-mm dia, molded epoxy type, flat lens	0.5	2.5	5	10	800	-	Photo Sensor	9
	PS4012		0.1	0.5	5	1	880	-	Photo Sensor	
	PD401		1	4	5	0.1	800	-	Photo Switch	
	PS4032	3-mm dia, molded epoxy type, flat lens	1.5	5	5	10	880	-	Photo Sensor	18
	PD403		0.5	2	5	0.1	800	-	Optical fiber	
	PS502	3.4mm dia, axial-lead type	3	15	5	10	800	46	Photo Sensor	19
	PS5022		0.4	2	5	1	880	46	Photo Sensor	
	PD502		1	4	5	0.01	800	32	Photo Switch	
	PS511	5mm dia, molded epoxy type with high precise flat lens	0.5	2.5	5	10	800	120	Photo Sensor	10
	PS5112		0.7	3.5	5	10	880	120	Optical fiber	
	PD511		1	5	5	0.1	800	120	Optical fiber	
	PS504	3.6mm dia, side-view type	2	10	5	10	800	75	Photo Sensor	13
	PS5042		0.3	1.4	5	1	880	75	Photo Sensor	
	PD504		3	15	5	0.1	800	50	Photo Sensor	
	PS505	Side-view type, high directivity	3	14	5	10	800	30	Photo Sensor	14
	PS5052		0.3	1.4	5	1	880	30	Photo Sensor	
	PD505		0.8	3.5	5	0.01	800	30	Photo Sensor	
Units			mA		V	mW/cm ²	nm	deg.		

▼ PACKAGE DIMENSIONS

Unit: mm ● AN, BN, CN, DN, PP / ①: Cathode ②: Anode

PS, PD/①:Emitter ②:Collector



$T_a = 25^\circ\text{C}$

Type No.	Absolute Maximum Ratings								Electro-Optical Characteristics								Features	fig.
	Input			Output			Operating Temp.	Storage Temp.	Input		Output	Transfer Characteristics						
	Power Dissipation	Forward Current	Reverse Voltage	Collector Emitter Voltage	Emitter Collector Voltage	Collector Current			Forward Voltage ≈ 1	Reverse Current	Dark Current ≈ 2	Photo Current ≈ 3	Response Time	Current Transfer Rate	Collector Saturation Voltage			
	Pd	I _F	V _R	V _{CEO}	V _{ECO}	I _C			T _{opr}	T _{stg}	V _F TYP.	I _R MAX.	I _{CEO} MAX.	I _C TYP.	T _r •T _f TYP.	CRT TYP.		
KU107-01	75	30	4	30	5	20	-30~+85	-30~+100	2.1	100	0.2	1.5	7	15	0.15	Photointerrupter	1	
KU107-02	100	50	4	30	5	20	-30~+85	-30~+100	1.2	10	0.2	10.0	7	50	0.15	Photointerrupter		
KU108	100	30	4	30	5	20	-10~+80	-40~+90	1.7	100	0.2	1.0	7	10	0.15	Oil-level sensor	2	
KU109-01	75	30	4	30	5	20	-30~+85	-30~+100	2.1	100	0.2	1.5	7	15	0.15	Photointerrupter	3	
KU109-02	100	50	4	30	5	20	-30~+85	-30~+100	1.2	10	0.2	10.0	7	50	0.15	Photointerrupter		
KU109-22	100	50	4	30	5	20	-30~+85	-30~+100	1.2	10	0.2	5.0	7	25	0.15	Photointerrupter	4	
KU109-23	100	50	4	20	5	20	-30~+85	-30~+100	1.2	10	1.0	15.0	400	1500	0.70	Photodarlington Output		
KU110-01	75	30	4	30	5	20	-30~+85	-30~+100	2.1	100	0.2	1.5	7	15	0.15	Photointerrupter	5	
KU110-02	100	50	4	30	5	20	-30~+85	-30~+100	1.2	10	0.2	10.0	7	50	0.15	Photointerrupter		
KU129	100	50	4	20	5	30	-30~+85	-30~+100	1.2	1.0	1.0	15.0	400	150	0.70	Photodarlington Output	6	
KU136-01	70	50	5	20	5	20	-20~+80	-30~+100	1.2	1.0	0.2	0.3	5	—	0.15	Reflective type Photointerrupter	7	
KU139-32	100	50	4	30	5	20	-30~+85	-30~+100	1.2	10	0.2	0.8	7	4	0.15	Photointerrupter	8	
Units	mW	mA	V	V	V	mA	C		V	μA	μA	mA	μsec	%	V	—		

58

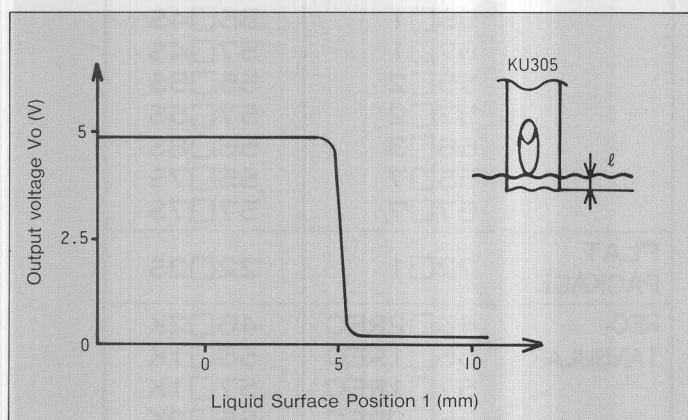
▼ OPTOSWITCH(2) CUSTOM SPECIFICATION EXAMPLES

 $T_a = 25^\circ\text{C}$

Type No.	Supply Voltage Vcc	Operating Temp. Topr	Storage Temp. Tstg	Output Current Io	Output Voltage Vo	Features	fig.
KU305	5V±10%	-10~+80°C	-40~+90°C	20mA MAX. (SINK)	V _{OH} =4V _{MIN} . R _L =3KΩ V _{OL} =0.6V _{MAX} .	● Oil-level detection	9
KU306	5V±10%	± 0~+60°C	-25~+80°C	20mA MAX. (SINK)	V _{OH} =4V _{MIN} . R _L =4.7KΩ V _{OL} =0.4V _{MAX} .	● Photointerrupter ● Detection distance: 8±1mm from tip	10
KU307	5V±5%	+ 5~+45°C	-40~+75°C	7mA MAX. (SINK)	V _{OH} =2.4V _{MIN} . R _L =10KΩ V _{OL} =0.4V _{MAX} .	● Paper detection ● Detection distance: 0 to 17mm (for 0.5 reflectivity)	11
KU308	5V±5%	± 0~+60°C	-20~+75°C	3mA MAX. (SINK)	V _{OH} =4.5V _{MIN} . R _L =10KΩ V _{OL} =0.4V _{MAX} .	● Black paper detection ● Detection distance: 2 to 7mm	12

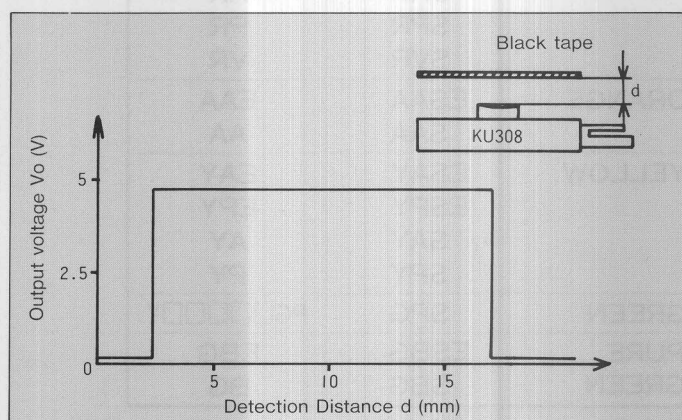
● The products listed above are typical examples of custom specifications.

▼ KU305/Liquid Surface Position -Output Voltage Characteristics

(RL=3K Ω , Liquid:silicon oil)

▼ KU308 / Detection Distance -Output Voltage Characteristics

($R_L=10K\Omega$, Detection Object:black tape)



▼ **PACKAGE DIMENSIONS** Unit: mm

fig.9

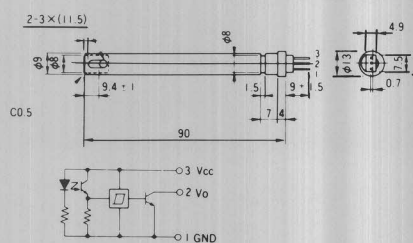


fig.10

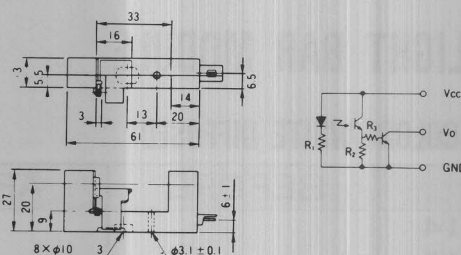


fig.11

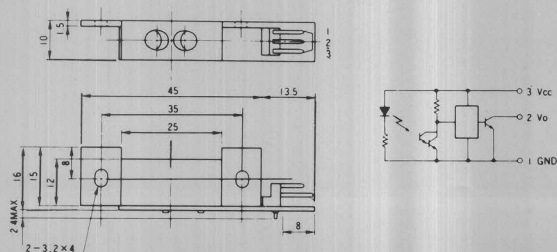
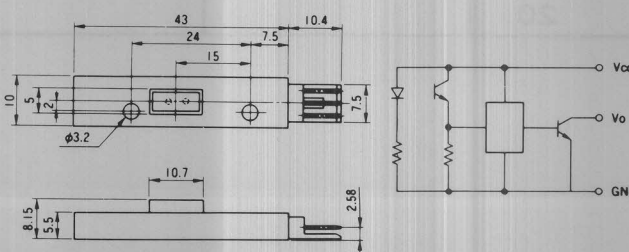


fig.12



LIST OF OLD AND NEW TYPE NUMBER

[I] LED LAMPS

BEFORE REVISED

ESBR

①

5501

②



AFTER REVISED

EBR

①'

5504S

②'

① LED DIE MATERIAL (CHIP)

	BEFORE	AFTER
RED	ESBR SBR SAR SPR SVR	EBR BR AR PR VR
ORANGE	ESAA SAA	EAA AA
YELLOW	ESAY ESPY SAY SPY	EAY EPY AY PY
GREEN	SPG	PG□□□□Y
PURE GREEN	ESBG SBG	EBG BG

② NUMBERING OF SPECIFICATION

	BEFORE	AFTER
ROUND SHAPE	34□1 39□1 34□3 55□1 57□1 55□2 57□2 56□3 55□7 57□7	34□2S 39□2S 34□3S 55□4S 57□4S 55□5S 57□5S 56□8S 55□7S 57□7S
FLAT PACKAGE	22□1	22□2S
REC- TANGULAR	46□2REC 55□1REC 57□1REC 55□2REC 57□2REC 55□6REC 78□1REC	46□2K 55□1K 57□1K 55□2K 57□2K 55□6K 78□1K
SQUARE	55□1SQR	55□3K
TRIANGLE	55□3TRI 55□2TRI	55□3T 55□2T
CHIMNEY	25□1DEB 24□4DEB	25□3D 24□4D
BI-COLOR	5111	5114S-1

[II] LIGHT BAR MODULE

▼ LENS COLOR : WHITE DIFFUSED

	BEFORE	AFTER
MU14 15 16 17 20	—□101	—□105

● ROUND SHAPE

BEFORE	AFTER	PAGE
ESBR/SBR5507	※1 EBR/BR5007S	14
SPR5507	※1 PR5007S	
SAA5507	※1 AA5007S	
SAY5507	※1 AY5007S	
SPY5507	※1 PY5007S	
SBG5507	※1 BG5007S	
ESBR/SBR5501	EBR/BR5504S	15
SPR5501	PR5504S	
SAR5501	AR5504S	
ESAA/SAA5501	EAA/AA5504S	
ESAY/SAY5501	EAY/AY5504S	
ESPY/SPY5501	EPY/PY5504S	
ESBG/SBG5501	EBG/BG5504S	
ESBR/SBR5531	EBR/BR5534S	
SPR5531	PR5534S	
SAR5531	AR5534S	
ESAA/SAA5531	EAA/AA5534S	
ESAY/SAY5531	EAY/AY5534S	
ESPY/SPY5531	EPY/PY5534S	
SPG5531	PG5534SY	
ESBG/SBG5531	EBG/BG5534S	
ESBR/SBR5502	EBR/BR5505S	
SPR5502	PR5505S	
SAR5502	AR5505S	
ESAA/SAA5502	EAA/AA5505S	
ESAY/SAY5502	EAY/AY5505S	
ESPY/SPY5502	EPY/PY5505S	
ESBG/SBG5502	EBG/BG5505S	
ESBR/SBR5532	EBR/BR5535S	
SPR5532	PR5535S	
SAR5532	AR5535S	
ESAA/SAA5532	EAA/AA5535S	
ESAY/SAY5532	EAY/AY5535S	
ESPY/SPY5532	EPY/PY5535S	
SPG5532	PG5535SY	
ESBG/SBG5532	EBG/BG5535S	
ESBR/SBR3401	EBR/BR3402S	17
SPR3401	PR3402S	
SAR3401	AR3402S	
ESAA/SAA3401	EAA/AA3402S	
ESAY/SAY3401	EAY/AY3402S	
ESPY/SPY3401	EPY/PY3402S	
ESBG/SBG3401	EBG/BG3402S	
ESBR/SBR3431	EBR/BR3432S	
SPR3431	PR3432S	
SAR3431	AR3432S	
ESAA/SAA3431	EAA/AA3432S	
ESAY/SAY3431	EAY/AY3432S	
ESPY/SPY3431	EPY/PY3432S	
SPG3431	PG3432SY	
ESBG/SBG3431	EBG/BG3432S	
ESBR/SBR3403	EBR/BR3403S	19
SPR3403	PR3403S	
ESAA/SAA3403	EAA/AA3403S	
ESAY/SAY3403	EAY/AY3403S	
ESPY/SPY3403	EPY/PY3403S	
ESBG/SBG3403	EBG/BG3403S	

BEFORE	AFTER	PAGE
ESBR/SBR3433	EBR/BR3433S	19
SPR3433	PR3433S	
ESAA/SAA3433	EAA/AA3433S	
ESAY/SAY3433	EAY/AY3433S	
ESPY/SPY3433	EPY/PY3433S	
SPG3433	PG3433SY	
ESBG/SBG3433	EBG/BG3433S	

※1) 5007S : □0.5 Long lead type with stand off

● FLAT PACKAGE

BEFORE	AFTER	PAGE
SBR2231	※2 BR2272S	20
SPR2231	※2 MPR2272S	
SAA2231	※2 MAA2272S	
SAY2231	※2 MAY2272S	
SPY2231	※2 MPY2272S	
SPG2231	※2※3 MPG2272S	
SBG2231	※2 MBG2272S	
ESBR/SBR2201	EBR/BR2202S	
SPR2201	PR2202S	
SAR2201	AR2202S	
SAA2201	AA2202S	
SAY2201	AY2202S	
SPY2201	PY2202S	
SBG2201	BG2202S	
ESBR/SBR2221	EBR/BR2222S	20
SPR2221	PR2222S	
SAR2221	AR2222S	
SAA2221	AA2222S	
SAY2221	AY2222S	
SPY2221	PY2222S	
SPG2221	PG2222SY	
SBG2221	BG2222S	

※2) 2272S : Low-current type

※3) λp : 560nm

● BI-COLOR

BEFORE	AFTER	PAGE
SPRY5111	PRY5114S-1	27
SPRG5111	PRG5114S-1	

RECTANGULAR

BEFORE	AFTER	PAGE
SBR7851REC	BR7851K	21
SPR7851REC	PR7851K	
SAA7851REC	AA7851K	
SAY7851REC	AY7851K	
SPY7851REC	PY7851K	
SPG7851REC	PG7851KY	
SBG7851REC	BG7851K	
ESBR/SBR5551REC	*EBR/BR5351K	
SPR5551REC	*PR5351K	
SAA5551REC	*AA5351K	
SAY5551REC	*AY5351K	22
SPY5551REC	*PY5351K	
SPG5551REC	*PG5351KY	
SBG5551REC	*BG5351K	
SPR5552REC	PR5552K	
SAA5552REC	AA5552K	
SAY5552REC	AY5552K	
SPY5552REC	PY5552K	
SPG5552REC	PG5552KY	
SBG5552REC	BG5552K	
SPR5556REC	PR5556K	22
SAA5556REC	AA5556K	
SAY5556REC	AY5556K	
SPY5556REC	PY5556K	
SPG5556REC	PG5556KY	
SBG5556REC	BG5556K	
SPR4652REC	PR4652K	
SAA4652REC	AA4652K	
SAY4652REC	AY4652K	
SPY4652REC	PY4652K	
SPG4652REC	PG4652KY	
SBG4652REC	BG4652K	

*5351K : □0.5 Long lead type

SQUARE

BEFORE	AFTER	PAGE
SBR5551SQR	BR5553K	21
SPR5551SQR	PR5553K	
SAA5551SQR	AA5553K	
SAY5551SQR	AY5553K	
SPY5551SQR	PY5553K	
SPG5551SQR	PG5553KY	
SBG5551SQR	BG5553K	

TRIANGLE

BEFORE	AFTER	PAGE
SPR5552TRI	PR5552T	24
SAA5552TRI	AA5552T	
SAY5552TRI	AY5552T	
SPY5552TRI	PY5552T	
SPG5552TRI	PG5552TY	
SBG5552TRI	BG5552T	
SPR5553TRI	PR5553T	
SAA5553TRI	AA5553T	
SAY5553TRI	AY5553T	
SPY5553TRI	PY5553T	
SPG5553TRI	PG5553TY	24
SBG5553TRI	BG5553T	

CHIMNEY

BEFORE	AFTER	PAGE
SPR2531DEB	PR2533D	24
SAA2531DEB	AA2533D	
SAY2531DEB	AY2533D	
SPG2531DEB	PG2533DY	
SBG2531DEB	BG2533D	
SBR2434DEB	BR2434D	
SPR2434DEB	PR2434D	
SAA2434DEB	AA2434D	
SAY2434DEB	AY2434D	
SPY2434DEB	PY2434D	
SPG2434DEB	PG2434DY	24
SBG2434DEB	BG2434D	

LIGHT BAR MODULE (WHITE DIFFUSED)

BEFORE	AFTER	PAGE
MU14-2101	MU14-2105	33
MU14-3101	MU14-3105	
MU14-4101	MU14-4105	
MU14-5101	MU14-5105	
MU15-2101	MU15-2105	
MU15-3101	MU15-3105	34
MU15-4101	MU15-4105	
MU15-5101	MU15-5105	
MU16-2101	MU16-2105	
MU16-3101	MU16-3105	
MU16-4101	MU16-4105	
MU16-5101	MU16-5105	
MU17-2101	MU17-2105	
MU17-3101	MU17-3105	
MU17-4101	MU17-4105	
MU17-5101	MU17-5105	
MU20-2101	MU20-2105	
MU20-3101	MU20-3105	
MU20-4101	MU20-4105	
MU20-5101	MU20-5105	

ITEMS TO BE REPLACED

NEW	TO BE DISCONTINUED	
EBR/ BR5351K	EBR/ BR5551K	
PR5351K	PR5551K	
AA5351K	AA5551K	
AY5351K	AY5551K	
PY5351K	PY5551K	
PG5351K	PG5551K	
BG5351K	BG5551K	
BR3365S	BR3665S	
VR3365S	VR3665S	
PR3365S	PR3665S	
AA3365S	AA3665S	
AY3365S	AY3665S	
PY3365S	PY3665S	
PG3365S	PG3665S	
BG3365S	BG3665S	
EBR/ BR5007S	EBR/ BR5507S	
PR5007S	PR5507S	
AA5007S	AA5507S	
AY5007S	AY5507S	
PY5007S	PY5507S	
BG5007S	BG5507S	
BR5063X	BR5763X	
MVR5063X	MVR5763X	
MPR5063X	MPR5763X	
MAA5063X	MAA5763X	
MAY5063X	MAY5763X	
MPY5063X	MPY5763X	
MPG5063X	MPG5763X	
MBG5063X	MBG5763X	
BR5064X	BR5764X	
MVR5064X	MVR5764X	
MPR5064X	MPR5764X	
MAA5064X	MAA5764X	
MAY5064X	MAY5764X	
MPY5064X	MPY5764X	
MPG5064X	MPG5764X	
MBG5064X	MBG5764X	
BR5073X	BR5773X	Current types shall be stopped from Dec. 1990
MVR5073X	MVR5773X	
MPR5073X	MPR5773X	
MAA5073X	MAA5773X	
MAY5073X	MAY5773X	
MPY5073X	MPY5773X	
MPG5073X	MPG5773X	
MBG5073X	MBG5773X	
MVR5074X	MVR5774X	
MPR5074X	MPR5774X	
MAA5074X	MAA5774X	
MAY5074X	MAY5774X	
MPY5074X	MPY5774X	
MPG5074X	MPG5774X	
MBG5074X	MBG5774X	
BR5085X	BR5785X	
VR5085X	VR5785X	
PR5085X	PR5785X	
AA5085X	AA5785X	
AY5085X	AY5785X	
PY5085X	PY5785X	
PG5085X	PG5785X	
BG5085X	BG5785X	

NEW	TO BE DISCONTINUED	
BR5362X	BR5562X	
VR5362X	VR5562X	
PR5362X	PR5562X	
AA5362X	AA5562X	
AY5362X	AY5562X	
PY5362X	PY5562X	
PG5362X	PG5562X	
BG5362X	BG5562X	
BR3368S	BR3668S	
MVR3368S	MVR3668S	
MPR3368S	MPR3668S	
MAA3368S	MAA3668S	
MAY3368S	MAY3668S	
MPY3368S	MPY3668S	
MPG3368S	MPG3668S	
MBG3368S	MBG3668S	
BR3368S	BR3868S	
MVR3368S	MVR3868S	
MPR3368S	MPR3868S	
MAA3368S	MAA3868S	
MAY3368S	MAY3868S	
MPY3368S	MPY3868S	
MPG3368S	MPG3868S	
MBG3368S	MBG3868S	
BR3378S	BR3878S	
MVR3378S	MVR3878S	
MPR3378S	MPR3878S	
MAA3378S	MAA3878S	
MAY3378S	MAY3878S	
MPY3378S	MPY3878S	
MPG3378S	MPG3878S	
MBG3378S	MBG3878S	
N□□245F	N□□245	Current types shall be stopped from Dec. 1990
N□G245FP	N□G245P	
N□□247F	N□□247	
N□G247FP	N□G245P	